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ORIGINAL ARTICLES.

METHOD AND RESULTS OF SIMPLE EXTRACTION OF CATARACTS.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, June, 1892.

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OF NEW YORK.

Gentlemen:—When your President honored me with an invitation to this meeting and to read a paper, I thought that a description of simple extraction and its results, good and bad, might perhaps be more acceptable to the Society than any other subject I could have chosen.

I shall confine my remarks to the method practiced, and the results obtained, by myself during the last six years, *i. e.*, since I adopted simple extraction as the general operation. My views and rules are based on the experience gained by 623 simple extractions, intercurrent with which 60 combined extractions (about 10 per cent.) were made. No cases are omitted except such traumatic and complicated cataracts in which the cataract was the minor evil, for instance partial detachment of the retina complicated with cataract, and the like.

The *method of operating* such as I practice it, though scarcely offering anything absolutely new, differs in many important details and as a whole, both in principle and execution, materially from all others.

THE PREPARATION OF THE PATIENT FOR THE OPERATION.

The patient should be free from any acute disease, for instance bronchitis, exacerbations of albuminuria or diabetes, rheumatism and the like. His conjunctiva must be reasonably free from pathogenic germs. Dacryocysto-blenorrhœa and chronic purulent conjunctivitis absolutely counterindicate the operation. In dacryocysto-blenorrhœa the lachrymal sac should be largely split and rendered aseptic, and if this be impossible, obliterated before the operation is undertaken. Chronic purulent conjunctivitis has to be completely cured with nitrate of silver and other remedies, even if it takes six months or a year, before an operation of extraction is justifiable.

Preliminary ripening operations are, in my opinion, almost always superfluous. I prefer the risk of extracting an unripe cataract to that of any ripening method with which I have become acquainted. The leaving of remnants behind has, in the manner in which I operate, very little to signify. Locked up in the capsule they produce no iritis, and can easily and successfully be dealt with by the secondary division of the capsule.

I avoid operating on *cataracts swollen by imbibition.* They render the section difficult and rarely come out cleanly, whereas the immature cataracts, known under the name of nuclear sclerosis, if the anterior chamber is deep, mostly—not always—come out entire.

The patient is placed on an operating chair, opposite a window, or in cloudy weather, near an Argand burner whose light is concentrated on the patient's eye with a hand magnifier. The instruments are carefully cleansed with corrosive sublimate solution 1:5,000, then held in boiling water for a short time, immediately before being used.

The eye is anæsthetized by three instillations of a 4 per cent. solution of cocaine, fifteen, ten and five minutes before the operation. The lids and surroundings are carefully washed with soap, then with corrosive sublimate, with which also the inner surface of the upper lid is washed by means of a pledget of absorbent cotton. From the first instillation of cocaine until the commencement of the operation the eye is kept closed. The patient is subjected to no preparatory treatment, except a bath and thorough cleansing of his face and head. Each patient is examined when or before he enters the hospital, whether his internal organs are healthy, in particular his nerve centers, lungs, heart, digestive and urinary organs.

The operator stands behind the patient's head, operates on the right eye with his right hand (upper section always), on the left eye with his left hand. The lids are kept apart by a wire speculum. I prefer the Moorfield's speculum, or one which Tiemann lately made for me, both being modifications of the large

Figure 1.

Graefe speculum, preventing the ends of the branches from pressing on the eyeball by its own weight, the long curved parts of the branches hanging down and resting upon the temple.

The eye is steadied by the operator, who implants the teeth of a fixing forceps with his free hand into

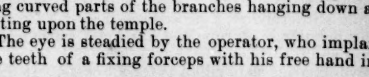

Figure 2.

the conjunctival and episcleral tissue immediately below the lower edge of the cornea. When the speculum is applied, and before the eyeball is steadied, a drop or two of a 1:5,000 solution of mercuric bichloride is let fall on the eyeball.

EXECUTION OF THE OPERATION.

The *most important step of the whole operation is the corneal section.* For full-sized cataracts it comprises exactly the upper half of the cornea, for smaller, Morgagnian, and soft cataracts somewhat less. A perfect section passes in its whole extent exactly

through the transparent margin of the cornea, the knife (see Figure 3) remaining in the same plane

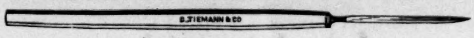

Figure 3.

throughout, particular care being taken that in completing the section the blade of the knife is neither turned forward nor backward. In many cases a small, central conjunctival flap is formed which, if anything, is an advantage.

This section is distinguished by its accurate and firm closure. It does not favor prolapse of the iris as the peripheric section does, nor does it lead to slow healing, secondary infection, and adhesions or incarcerations of the iris, as the more central flap often does. By cutting the lamellæ of the cornea obliquely the contents of the eyeball, by pressing the posterior lip of the wound toward the anterior, at once seal the section, so that the patient can move, open and shut the eye without disturbing the wound.

I open the capsule by passing the delicate sharp lance of the *cystotome* behind the iris from the nasal

Figure 4.

to the temporal side, thus incising the capsule near its periphery, parallel to the corneal section. This mode of cystotomy leaves the centre of the capsule unbroken and prevents the adhesions resulting from the contact of a torn and bruised pupillary edge of the iris with shreds of capsule and remnants of lens. The expulsion of the cataract and the clearing of the pupillary field can be done through the peripheric opening of the capsule as well as through the central.

I confine the removal of a piece of the anterior capsule to the thickened central portions of hypermature cataracts. I again and again have tried to remove the anterior capsule with forceps, a procedure that has become rather popular in Europe and has some warm advocates also in this country, but I have not found it so advantageous as to adopt it for all cases. It may be possible to *remove* a piece of capsule, not merely to *lacerate* it, and in this way to obtain a clearer pupil than by the extensive laceration of the capsule, but the result, as far as I have experience, will be simple posterior synechiæ in many cases and plastic iritis with its consequences in some, and the posterior capsule, to which the remnants of the anterior are agglutinated, mostly dots and wrinkles in the course of months and years, with corresponding falling off of sight.

Among the *accidents of the extraction of the anterior capsule* I may mention that in some cases when the capsule is tough the piece torn out is not limited to the pupillary space but extends to the equator of the lens, in others the whole crystalline body is drawn out. In both events the vitreous chamber is opened, a lesion which extends the wound and favors the occurrence of prolapse of the iris.

Of the many modifications of the original Liebreich or Mathieu forceps, the essential feature of which consists in the position of the teeth on the surface

Figure 5.

and not on the tip of the branches, I prefer the one Tiemann made for me and which I described two years ago (*Arch. Ophthalmology*, 1890, p. 288). When the instrument is closed, the teeth are hidden and the instrument is smooth all around. In this way the branches are introduced into the eye without scraping at the iris or raising the cornea perceptibly. When the branches separate, the teeth on the lower side project, and when pressed again together grasp so much of the anterior capsule as is desired. The forceps close only at the end, between the teeth, so that the iris is not included. Dr. Eugene Smith has so modified this instrument, that the tooth bearing ends are sunk slightly below the straight prolongation of the branches, thus dipping readily into the pu-

Figure 6.

pillary space. The instrument is well devised but a trifle bulky, and is not so readily introduced as the one spoken of before. I have tried it once only.

The *expulsion of the lens* is effected by pressing the lower part of the cornea, with a Daviel's spoon, directly toward the centre of the globe. When the lens presents in the gaping section its exit is aided and

Figure 7.

followed up by slight strokes with the spoon on the outer surface of the cornea, so as to expel the lens, together with its cortex, as a whole. Should the pupil not readily expand, the rigid sphincter portion is drawn backward with the wire loop which is held in the other hand of the operator to aid in the expulsion of the lens. Should the section prove too small it is enlarged at one end with a pair of strabismus

Figure 8.

scissors, which also serve for cutting the iris in iridectomy, just as the capsule forceps serves in grasping and drawing out the iris for the same purpose. In the majority of cases the cystotomy and expulsion of the lens can be done without keeping the eye steadied with the fixing forceps. In restless people and pro-

lapse of vitreous I remove not only the fixing forceps but also the speculum immediately after the corneal section, and expel the lens by external pressure with the lids. I scarcely ever have to resort to the wire loop or any other traction instrument to get the lens out.

The *clearing of the pupil* is effected almost exclusively by pressing with the edge of the lower lid on the cornea. The remnants are wiped away with a well sterilized highly polished curette; neither the

Figure 9.

edge of the upper lid nor that of the lower is allowed to get in contact with the wound. The so-called milking manœuvre, by which the remnants were formerly pressed into the wound and *wiped out of it with the edge of the upper lid is highly reprehensible*, this procedure being as nearly a direct inoculation of germs as is possible. Equally reprehensible is it to introduce a curette or spoon into the anterior chamber to scoop remnants out immediately after such instrument has been passed over the cornea to expel the lens. There are germs on the cornea and conjunctiva even after the most careful disinfection. They are taken up by the spoon and carried into the anterior chamber. No instrument that enters the eye should have touched any living tissue, including the fingers of the operator, the skin of the lids or the conjunctiva of the patient.

During the operation I repeatedly let some drops of a 1-10,000 solution of corrosive sublimate fall on the wound and its surroundings, and when the operation is completed I smooth out the conjunctival flap, if there be any, introducing the end of a polished grooved spatula (see Fig. 6), previously moistened with the above sublimate solution into the anterior chamber and passing it through the wound from one end to the other, stroking from within outward, in order to remove particles of lens, redress a curved-in flap, and carefully adjust the edges of the wound.

This is, however, not done before *the iris has spontaneously or artificially recovered its natural position*. Should the corneal section be too peripheric, the best thing is to make a small iridectomy at once, for peripheric (Graefe's) sections commonly lead to large and harmful prolapses. If the iris does not spontaneously resume its position, frequently it does so when the lower part of the cornea is pressed upon with the edge of the lid. This paradoxical phenomenon may thus be explained. The iris being pinched in the tightly closing wound, pressure on the lower part of the cornea raises the flap and disengages the iris which then, by its natural elasticity and contraction of the sphincter pupillæ, can resume its natural position. If this encheiresis fail, the iris should be pushed back with a spatula into the anterior chamber. When the periphery of the iris remains folded in the sinus of the anterior chamber, it is smoothened out with the olive tipped point of a probe (see Fig. 9) introduced into the iris angle, behind the opaque corneal margin.

Formerly I washed the anterior chamber out with a solution of biniodide of mercury or boracic acid, but gradually this procedure has fallen into desuetude without appreciable influence on the results. I can say the same of instillations or eserine or pilocarpine after the operation. *When the operation is finished*, and the patient can open and shut his eyes without disturbing the flap on the iris, I drop a few drops of 1-10,000 bichloride of mercury solution on the wound and into the conjunctival sac and *let him go to bed without any bandage*, holding his eyes open or shut at his pleasure. The nurses help to undress, he lies down and closes his eyes. In from 5 to 20 minutes I inspect the eye again, and if everything is all right I bandage it. The *dressing* consists of a patch of moistened corrosive sublimate gauze, and a pad of moistened absorbent cotton fastened with two strips of isinglass plaster. The non-operated eye is covered the same way for a day or two. In nervous, old, or timid people the good eye is barely covered by a patch of gauze, fastened over the brow by a strip of plaster. The patient is instructed to keep both eyes gently closed and use the good eye only for eating and calls of nature. The first day the greatest possible rest is recommended. From the second day old people may sit up a part of the day. Since September 1891, I have followed this practice of letting the patients go to bed with their eyes unbandaged in 125 cases. In one of them I found the pupil displaced. I stroked the iris back, but there was a prolapse of iris when the eye was opened on the fourth day. In two of them I found an iris prolapse which I cut at once and obtained a smooth healing. Having in this way satisfied myself that in the other cases, the patients had stood the transportation from the chair to the bed and the undressing without a tendency to prolapse, was less in dread of this event, yet it occurred in a few instances, mostly by some accident.

Ordinarily there is pain for 5 or 6 hours after the operation, then the eye is and remains quiet. If after hours or days of freedom from irritation the patient, by an injury, a fit of coughing, or other more or less violent exercise, or without any assignable cause, feels a sudden sharp pain in the eye which gradually dies out in an hour, then in all probability a prolapse of iris has occurred. If I am informed of it within several hours, I open the eye, and in case the supposition prove true, I cut the prolapse, reducing the edges of the iris, if there be no irritation, *i.e.*, the prolapse is simply mechanical. If I notice the prolapse later, on the third or fourth day, I leave it untouched. Some of the small ones disappear, others skin over and produce no irritation, others become larger, constricted at their base or cystoid. I leave all these until the irritation has disappeared, and then cut them off. This operation, when performed after the eye has become white, is nothing more than the amputation of a small staphyloma and is usually followed by a smooth and permanent recovery.

For a time I wanted to *test the practicability of dealing with the iris-prolapse, under all conditions, as soon as it came to my notice*. The majority of cases did well, but there were three most unfortunate ones, the only failures I have had from iris prolapse whether operated on or left alone. Those three cases were one loss by suppuration, and two losses by irido-cyclitis chronica, both followed by sympathetic ophthalmia, so that both eyes became blind.

The first (extraction, with removal of a portion of anterior capsule), a man of 76 years, had a prolapse on the fourth day, when the eye was opened for the first time. It was excised the whole length of the wound. The next day no reaction, but on the temporal side there was a small angular incarceration, with a small bead of vitreous presenting.

Six days later the incarcerated portion had become bulging and was abscised. Infiltration of the wound developing into panophthalmitis followed. The patient had chronic conjunctivitis.

The second had a large prolapse cut on the fourth day, as soon as it was noticed. Edges reduced. Clean iridectomy, no irritation the following day. In the next night he struck his eye, causing some incarceration. Slow irido-cyclitis developed, followed in third month by iritis in the other eye. Both eyes were lost. Patient suffered intensely from rheumatism, and his eyes have given him a great deal of pain for a year after the operation.

The third case was a complicated (cholesterinic) cataract in a man of 71. Extraction with a portion of anterior capsule. On fourth day small prolapse noticed in outer corner; abscised 20 days later. Slow irido-cyclitis. Strings of cholesterine in vitreous adherent to scar. Fifty-four days after extraction the first circumcorneal injection noticed in other eye. In six months closure of both pupils. S=1-00.

These excessively sad cases are depressing in the highest degree. Their disheartening effect is counterbalanced only by the overwhelming number of good results.

The patients are usually discharged at the end of the second week. By this time the irritation has usually disappeared. The pupil almost always is free from adhesions, but sometimes more or less obstructed by remnants of lens. The capsule stretching across it may be smooth, dotted or streaked. The average visual acuteness in the third week is $\frac{4}{10}$. For the next two or three months the vision frequently becomes a little sharper, but then it gradually and steadily declines, so that S. as high as $\frac{7}{10}$ or $\frac{8}{10}$ in the sixth week may be reduced to $\frac{2}{200}$ and even $\frac{1}{100}$, without any subsequent inflammation, but simply by dotting, thickening and wrinkling of the capsule. This course has been the rule, not only in my own operations, but also in those of other operators, so far as their patients have come to my notice.

Excepted from this rule are: 1. Those cases in which the lens has been removed in its capsule. 2. Those in which secondary capsulotomy has been made. 3. A moderate number of those in which a part of the anterior capsule has been removed. 4. A small number of those in which the center of the anterior capsule has been extensively lacerated during the extraction. Having watched these results in hundreds of cases, I have made for the majority of cases the *early secondary discission of the capsule an integral step, the final act of the operation.* Experience has taught me that the easiest and neatest performance, the smoothest recovery and the best permanent visual results may be expected, 1. If the pupillary area is free from products of inflammation. 2. If the secondary changes in the capsule are not too old. 3. If these changes have not yet begun, *i. e.*, during the first weeks or months after the extraction. For years I have practiced the early secondary discission of the capsule as a rule. The results have been so satisfactory that I continue the operation without any material change.

The *secondary discission is made with a knife-needle*, the stem of which is so proportioned to the size of the little knife that it stops the opening, admits of passing the needle in different directions through the anterior chamber without letting aqueous humor escape. The operation can be done only under artificial focal illumination.

The needle is commonly introduced at the temporal side of the cornea 2 or 3 mm. from the margin, then its point transfixes the capsule at the inner margin of the dilated pupil. The capsule is first cut horizontally across. Then the needle is passed in front of the lower segment of the capsule, transfixes it near the lower margin of the pupil and slits it by an upward incision. Then the needle is passed before the upper segment of the capsule, which is transfixed at the upper pupillary margin and cut by a downward incision. This is the typical form of secondary capsulotomy, and gives a large and free pupil. Many modifications of this type are needed, for the manner of splitting must be suited to the peculiarities of the case. Each case is a study for itself. We must select the thinnest places, those that offer the least resistance, for the splitting, under all conditions avoid dragging fibrous bands to and fro. A T-shaped incision answers the purpose frequently, a curved incision, passing around a dense part, is often sufficient, but a linear straight incision commonly closes again. We should not thrust the little knife more deeply into the vitreous than is necessary to make clean and sufficiently extensive cuts. Avoid deep ploughing of the vitreous, for there is a dark side in this operation, the importance of which I have learned of late only. I mean the *occurrence of glaucoma after secondary discission of the capsule.* In the April number of the *Archives of Ophthalmology* of 1892, p. 293, I published ten cases from my own practice. Sometimes the first day after the discission, sometimes a few days later, acute glaucoma breaks out, the eye grows painful, red, hard, and rapidly loses sight. Myotics relieve the symptoms, but control only mild forms of the disease. The others have all been cured by a prompt iridectomy. In all, the anterior chamber was filled with vitreous, and this seems to be the permanent condition when the opening in the capsule does not close again or some thin hyaline membrane is formed.

In evidence of this I may mention the case of a gentleman who had been operated on twenty years ago, by repeated discissions of a congenital cataract by the late Dr. C. R. Agnew. In one eye detachment of the retina had followed, in the other there was a round black pupil, increase of tension, glaucomatous excavation, gradual impairment of sight, contraction of the naso-frontal part of the visual field, and some floating opacities of the vitreous. S. 20-50. In this condition he was sent to me by a colleague who had just received and read the above publication. I made an iridectomy with a lance-shaped knife. Immediately after the corneal section healthy vitreous escaped, through which I introduced Tyrell's blunt hook, drew the iris out and cut it. Finding that only the inner half of the iris had been exsected, I at once introduced the hook again, drew the outer half out and cut it close to the sclerotic. Recovery prompt and good.

This has also been the method in other cases, with the difference that our introduction of the hook

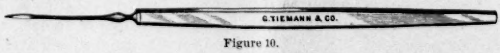

Figure 10.

Figure 11.

brought the iris out to the periphery. To try to grasp the iris in aphakial eyes with a pair of forceps is commonly unsuccessful. The iris recedes at the first pressure.

Messrs. Geo. Tiemann & Co., New York, have put all the instruments I use for primary and secondary cataract in a neat little case, which is very handy.

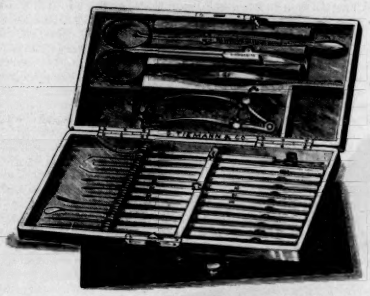

Figure 12.

STATISTICS.

I have published detailed accounts of the first 300 cases of simple extraction. (See *Arch. of Ophth.*, xvii, p. 91; xviii, p. 1; xix, p. 280.) The results were unusually satisfactory, viz.: good in 94⅓ per cent.; moderate in 4⅔ per cent.; failure in 1 per cent. I desire to mention that the unpromising cases were not related to the combined operation, but that the iridectomy was made only for special indications in which a manifest tendency to prolapse (on account of conditions lying in the eye, or created by the operation, too peripheric section, and the like) was the most frequent. Among the intercurrent 37 combined operations, *i. e.*, 11 per cent. of the whole number, there was no failure. Doubts have been expressed as to the reliability of such statistics, which means that the veracity or the sober judgment of the author is put in question. If we give the reader the data to verify our statistics, he may come forward and show our mistakes, or if he thinks our conclusions are too rosy, let him frankly utter his belief that we have been too enthusiastic. In my reports, as well as in those of several institutions, for instance, the New York Eye and Ear Infirmary, the Massachusetts Charitable Eye and Ear Infirmary, the Birmingham and Manchester Ophthalmic Hospitals, the cases are reported in tabular arrangement, with name and address of the patients. If in such publications no case is omitted, for what further evidence do the doubters ask?

We all know the fallacy of statistics unless the numbers are so great as to exclude the important element of chance. In presenting to you the results of the last 346 extractions, you will find that they have been less favorable than the first series of 327. Taking the two series together, we shall arrive nearer to the truth than by considering either alone.

A. UNCOMPLICATED CATARACTS, 301. LAST SERIES, 346 CASES.

Operated according to the simple method as above detailed.—Total, 257 cases: result good 227; moderate 28; failure 2; prolapse of iris 19. Secondary discission made in 163.

Simple extraction with removal of anterior capsule.—Total, 19. Good 13; moderate 5; failure 1. Discission 5; prolapse of iris 3.

Combined extraction.—Total 23. Good 18; moderate 4; failure 1. Discission 16; incarceration of iris 1.

After preliminary iridectomy.—Total 2. Good 2; discission 1.

B. COMPLICATED CATARACTS, 45.

Simple extraction. Total 33. Good 23; moderate 4; failure 6. Included in these figures are two temporarily good eyes, healing and vision good. Detachment of retina in old highly myopic eyes, occurring months after the operation. Discission 6; prolapse of iris 1.

Combined extraction.—Total 10. Good 8; moderate 1; failure 1. Discission 5.

After preliminary iridectomy.—Total 2; moderate 2.

Suppressing the decimals we obtain from the above (241 good, 44 moderate results and 11 failures);

84 per cent. good results; 13 per cent. moderate results, and 3 per cent. of failure.

Out of the 37 extractions with iridectomy, 2 were failures. 37 is too small a number to draw comparisons from. If we add the rate of success in the first 300 cases of simple extraction to these here reported we obtain: 89 per cent. good; 9 per cent. moderate results and 2 per cent. of failure. This outcome is still very satisfactory, showing that in 683 successive cases of cataract (the complicated included) in which the combined operation was performed in only 10 per cent. no more than 2 per cent. of failure had to be recorded.

In conclusion, Mr. President, let me say that in cultivating the operations for cataract *I have endeavored in the first place to operate as safely as possible, and in the second place to obtain the greatest acuteness of vision compatible with the safest method of operation.*

Discussion.

Dr. Julian J. Chisolm, Baltimore:—We are so accustomed, and I think properly, to look to Dr. Knapp for advice, that we always note his suggestions and frequently act upon them. I think that the profession as well as the public who are interested factors in blindness, are to be congratulated on the decided changes, which, according to Dr. Knapp's remarks, he has made in the after treatment of cataract cases. He now allows his patients to get up and walk to their beds with the eyes unbandaged. That seems to be a marked change from his former practice. He also releases the eye not operated upon on the second day which is an immense change from the former eight days of bandaging. He also covers the eye much more lightly. This is also a great advantage. I think that the profession in later years has found that excessive restraint is not an essential part of a successful cataract treatment, and that we may allow our patients a great deal more latitude in movement than formerly. He says that it is essential to keep the patients at rest for twenty-four hours, but that after the first day has passed it is not so important, and that he then allows the use of the second eye for certain purposes. Dr. Knapp notes nineteen prolapses in his last series. Before leaving Baltimore, I had occasion to look over my records for the last year as regards the number of cases of prolapse. In my patients, the eye operated upon is closed by adhesive strap or bandage while on the table and the patient is then allowed to walk to his bed with the good eye, if he has one. This eye is never bandaged. While it may be the patient's pleasure to remain quiet, they have no occasion to go to bed unless they desire to. They sit up from the time of the operation and take their regular meals with a liberty and a liberality which, if not injurious, and my experience has so proved it, is a great luxury to the individual. I have found that I have not more than nine per cent. of prolapses. Dr. Knapp has had about seven per cent. As is well known, I have gone further than Dr. Knapp has yet attained. I do not see the necessity of excluding light from any of my

patients. In over five hundred cases treated in the past five years I have allowed all these privileges of unrestraint to cataract patients and have had no occasion to regret it. The day will come when we shall find less need to restrict patients after cataract operations, and at the same time we shall not diminish the good results that all of us are so anxious to obtain. It was satisfactory to me in urging non-restraint practice, to find that Schweigger, who keeps his patients absolutely quiet, reports hernial troubles in seven per cent. He has, therefore, not gained much by his excessive care of keeping his patients on their back in bed. As to the removal of the hernia afterwards, I have been in the habit of excising those that I found. In the small prolapses, I have discarded excision and leave their disappearance to nature.

As to the dangers of extracting the anterior part of the capsule which I have done quite extensively of late, I find that whilst I secure a central pupil, posterior adhesions are not uncommon and that full dilatation under atropia does not constantly occur. I have however, found no detriment from this condition. The patients see well and continue to see well. I have not found that the adhesions led to any subsequent inflammatory trouble. I am still disposed to believe that if we can succeed in extracting the larger part of the anterior capsule by forceps, we avoid that second operation of cystotomy, which simple as it may seem, necessitates retaining the patients under treatment longer than they desire.

I am particularly gratified to find that Dr. Knapp has recently relinquished a great deal of the restraint which he formerly considered essential in the after treatment of cataract operations.

Dr. L. Webster Fox, Philadelphia:—It may not be inappropriate to bring to the notice of the members of the Association fine specimens of black cataract removed from three patients.

Case 1.—Female, age 50, gave the following history. In 1876 she gave birth to twins and immediately afterwards it was found that her vision grew dim, so that in six weeks the patient was not able to count fingers at arm's length. The cataract was removed May 11, 1890. The ordinary method was followed, with iridectomy, and the eye did well for three months, when a thickening of the capsule took place. The patient, during the period of her blindness, developed a high degree of convergent strabismus. On June 27, an operation was performed on both internal recti muscles and the eyes became straight.

By December the capsule in the left eye became so dense that vision fell to about 10-200. Having had no inflammatory reaction after the first operation, I obtained the consent of the patient to removed the lens of the right eye, which I did December 7. The operation was followed by satisfactory results. The following formula, cyl. +6 ax. 180° ⊂ cyl. —3, ax. 90 gave 20-70, and with a sph. +3 extra front J. 8, was read. These glasses were worn until June 21, 1891, when another examination was made on account of a loss of the visual acuity. This formula was as follows: Sph.— 1. cyl. +6 ax. 5°, two letters of 20-30 and with an extra front of sph. + 2 added J. 8 was read. The patient was examined in April of this year and no change was found in her vision. The thickened capsule still the same in the left eye. After the second operation erythropsia developed and continued for six months, when it gradually faded away and the eye has since remained normal to light sense.

Case 2.—Male, 61 years, was examined January 11, 1891, with the following history: The right eye was removed early in life on account of dropsy of the globe, by a physician in Boston. The left was always myopic to a high degree, but the patient was able to follow his occupation, book-binder, until April 13, 1880, when he suddenly lost his sight. He could not give a clear history of the trouble other than the sight grew bad and the cause was attributed to cataract. His family history was irrelevant. On January 25 I removed the cataract by the simple method; the only complication was a slight loss of vitreous which was highly fluid. The movement of the hand could be easily noticed after the operation. The eye did well until the night of the third day, when a sudden discharge of phosphene took place in the eye, which so alarmed the patient that he suddenly sprang from his bed; his nurse had difficulty in quieting him, an opiate was necessary to lessen pain. Early the next morning I found the eye ball very painful, high tension and vision gone. An intra-ocular hæmorrhage had taken place. Antiphlogystic treatment was resorted to, but the eye went from bad to worse and later the eye ball was removed to alleviate pain. Upon opening it I found complete detachment of the retina and a blood clot.

Case 3.—Female, age 61. Was not able to discern objects at a distance, high myopia, and during the last five years was practically blind. Upon examination I found double cataracts, both deeply pigmented but somewhat brownish in the centre. On June 21, 1891, I removed the lens (iridectomy) and the eye did well. Six weeks later an irido-cyclitis developed and the sight was lost. On November 8, 1890, I performed the simple method on the right eye and the result has been fairly satisfactory since. The patient has an acuity of vision equal to 20-100 with the best glasses. The specimens from the last patient are particularly interesting as they show the nucleus almost black while the cortical substance is translucent or almost white. These specimens have been preserved in a solution of boroglyceride. I shall have a chemist make an examination of these specimens and see whether any light can be thrown as to the causation of this pigmentation.

Dr. George E. Frothingham, Detroit:—This subject is one of great importance and I have been much interested in this paper. The statistics of Dr. Knapp show a very decided improvement over the statistics of former operations, but we all know that Dr. Knapp is a skilful operator, and in the reports of cases of simple extraction by many operators, the successes have been less numerous than in Dr. Knapp's cases. I remember looking over the report of Schweigger; there were 4.4 per cent. reported as absolute loss, and 19 per cent. of secondary cataract not reported as regards the results of the second operation. 76 per cent. only were reported as successful; and in the other reports, I have found that the percentage of successes was not better than in the operation of von Graefe. I have given some attention to this subject and have made a modified linear operation. I first extracted with the Beer knife. Soon afterward, the downward operation with the narrow knife was published. It was claimed to be as simple as couching, as perfect as the flap and as safe as the modified operation, and the suggestion was made that the operation might be done upwards. I published in 1874, an operation with the narrow knife very similar to, if not identical with, the simple operation. I entered the knife a little back of the clear margin of the cornea aiming to bring the apex within the clear margin of the cornea. I at first met with success, but I regret to say that I afterwards had to abandon it on account of the bad results which I had. I found that without iridectomy, there were the same difficulties in evacuating the lens as in the old flap operation. I found, however, the chief objection to be prolapse of the iris. This occurred in about ten per cent. of the cases and occurred as late as the fifth day, and some of the cases were very troublesome. I do not remember an eye that was absolutely lost.

Unless we can see these cases of prolapse early and replace them, we can do little. The eye which has been subjected to traumatism, bears illy another operation. As Dr. Knapp has declared, between the third and the tenth day we are debarred from operating on account of the increased danger. We must operate early or wait a long time and then inflammatory products have complicated so that I consider this one of the most serious complications with which we have to deal. I notice from Schweigger's report that he has 8.2 per cent. of prolapse and Dr. Knapp in 509 cases reports 42 cases of prolapse. We have therefore between eight and ten per cent. of prolapsed iris in this operation.

The question of sufficient vision is a very important one, and unless it can be shown that it gives a larger percentage of successful results we should be slow in adopting it.

In regard to the extraction of unripe cataracts by this method, my experience was that there was great difficulty in evacuating the lens thoroughly where the lens was immature and the cortex soft. We must have a lens that will slip through the iris, otherwise we cannot remove it except by traction instruments which cause bruising and stretching the iris, and result in complications such as iritis and plugging of the pupil with lens matter and inflammatory products.

My reason for iridectomy is that we can extract the lens through a smaller corneal incision. I believe that that will be generally admitted. It is a principle of general surgery that the larger the incision, the greater the traumatism and the less the likelihood of recovery. An incision of one-half the cornea is more dangerous and less likely to be kept in position than one not so large. Any of us who have made iridectomy with a small triangular knife know how impossible it is to displace the lips of the wound. The larger corneal incision endangers the continued coaptation of the

wound long enough for primary union to take place. That is the reason for the iridectomy. I must admit that the traumatism of iridectomy is most grave. It remains to be shown that we increase the traumatism more by iridectomy than by an increased extent of corneal incision. Until that is shown, I think that the smaller corneal incision is based upon proper principles of surgery. It will take a vast time and much experience to establish the fact that an incision involving one-half the cornea is as safe as a smaller one. Four or five hundred or even a thousand cases are not enough to establish it.

Dr. Henry D. Noyes, New York:—I think that I am bound to say something in regard to the attempt to cure cataract by medication or anything else than extraction, for this matter is in the air. It exists in New York and has cropped out here. I may simply say that it is my firm belief after an observation of many years, that these cases of improvement in vision, which it is true do present themselves, are founded upon the fact that there is a healthier condition of the eye and of the patient; and furthermore, that a careful examination of the natural history, development and progress of cataract, will convince any one that there are various stages through which it passes, with corresponding changes in vision. At first cataract may be attended with opacities of the vitreous which may clear up, permit improved sight. What is still more important is, to discriminate the particular variety of cataract with which one has to deal. There are forms which may remain stationary for twenty years. There is a gentleman, a distinguished member of this Association to whom I said in 1884 that he was beginning to have cataract. I also told him that he would never lose his sight or the vision which as a surgeon he must possess. He still remains in the condition he was eight years ago. This assumption that galvanism, external applications, manipulations, massage, instillations of boro-glyceride, etc., can have any effect in improving the vision is founded upon insufficient evidence, and the mistake is extremely probable of supposing an improvement from natural causes to be the result of treatment.

In regard to operations for cataract, I do not propose to take up unnecessary time, but I have been learning from year to year and I have come to the conclusion that simple extraction is *a priori* the extraction that ought to be done. The question I think stands in this position, that those who do iridectomy ought to give a reason to justify it, because they mutilate the eye. I am free to admit that the visual result may be as good with as without iridectomy, but I am in a position to assert that the man who does iridectomy must give a satisfactory reason for the iridectomy.

In the second place, I am perfectly convinced that the essential thing in the extraction of cataract is not so much the precise position of the incision, although I believe that the limbus is the proper place, but it must be an ample incision involving close upon one-half of the cornea, I want one-tenth less than one-half. The diameter of the lens then makes no stretching of the corneal tissues. It is on this that the subsequent removal of soft matter depends and rapid healing of the wound may be predicated. I have grown a great deal more bold with the iris than formerly. I am not afraid to push it back with a sterilized spatula with great care, and remove soft matter. I recognize the value of manipulation of the lower lid. A little trick which is of value is to allow the aqueous humor to collect and then open the eye and allow the aqueous humor to remove the debris. I have discarded all attempts at irrigation of the anterior chamber, neither do I introduce a syringe; I occasionally employ external irrigation, injecting fluid against the wound. Cleansing of the anterior chamber is of the highest importance. The removal of the blood and softened lens substance which remains in the lips of the wound is best accomplished by a pledget of cotton moistened with a 1-5000 bi-chloride solution. With this the eye ball is swept off and the cotton can be passed over the edges of the wound and it brings substances out of the anterior chamber both by its direct action and by its capillary attraction.

The opening in the capsule, I am not in the habit of making as Dr. Knapp does. I make it through the centre of the pupil and large, but I recognize the value of the cystome which he has demonstrated.

As to the dressing of the eye. I do not confine my patients with the rigor which formerly prevailed. I think that I have learned another thing and that is that the tendency to prolapse is largely produced by the pressure of the bandage. I think that favors prolapse. The attempt to tightly shut up the eye excites irritation and resistance on the part of the patient. As a dressing I apply a bandage more commonly of loose material with a small amount of cotton. This is often moistened with a solution of the bichloride to prevent the secretions from concreting and causing adhesions of the lids. This adhesion of the lids is one of the causes of irritation and causes the patient to make spontaneous efforts for his own relief. The prolapse of the iris is not so difficult of explanation. It depends upon three factors chiefly: First any rudeness in the operation itself giving rise to undue reaction, making the eye sensitive and preventing prompt adhesion of the wound. Second, and chiefly, the prolapse is produced by the efforts of the patient himself in his vigorous but unconscious efforts to keep the eye still. This may be brought about by the traction of the recti or the pressure of the orbicularis muscle. Thirdly, the prolapse may come from the accidental contact of the eye with the finger of the patient as he moves in bed. I think that the causes of prolapse may almost entirely be classed under the head of traumatism either from within or without. The reason that I still adhere to the bandage is because I consider the protection of the eye for the first two nights as an important safe-guard against accident. In the case of women where the bandage is troublesome on account of the hair, I sometimes use strips of india-rubber plaster with cotton beneath, but I am satisfied that undue pressure with the bandage is one of the favoring causes of prolapse. Furthermore, as to eserine or anything dropped into the eye, I have abandoned that. I am more apt to use atropia at the end of twenty-four hours, always at the end of forty-eight hours.

As to the capsule:—If there be any need for secondary capsulotomy, it is deferred until the second or third month, but I am perfectly ready to agree with Dr. Knapp in saying that capsulotomy is not always the simple operation which its ease of performance would indicate. I have seen it set up a most serious plastic irido-cyclitis, and early in my career I was made excessively cautious in doing this because of some sad experiences with irido-cyclitis and subsequent atrophy of the globe. Capsulotomy as described by Knapp is very beautifully conceived and admirably done at his hands, but there is another thing to be mentioned. We have inherited a fear of piercing the eye ball through the ciliary region but I think that in some respects we have grown too cautious about it. Within the last few years in occasional instances, where I had a thick capsule to deal with which one needle thrust through the cornea would not satisfactorily open, or which two needles passed through the cornea would not open, I have overcome the difficulty by passing a long double edged needle through the sclera and reached the pupillary area from behind, and although there is a little hæmorrhage, I have been surprised to find the reaction so insignificant. With the long lever thus afforded you can make a satisfactory opening which it is often impossible to do by any mode of procedure through the cornea. I have even passed one needle through the cornea and another long needle with double cutting edge through the sclera, in some difficult cases and attained success.

Dr. Eugene Smith, of Detroit:—Dr. Knapp has spoken of my forceps. I have brought with me several pairs that they might be seen. It is the forceps of Knapp with the exception of the dropping of the teeth. Finding it necessary to have the teeth project downward and backward to grasp the capsule, I had them made in that way. As that causes a little awkwardness in the introduction of the forceps, I have come to the conclusion that these teeth may be placed in a perfect plane. I have had an experience with thirty or forty cases and have yet to fail in extracting a piece of the capsule or in not so thoroughly rupturing the capsule as to prevent so far, every necessity for subsequent decision; I am fond of removing the anterior capsule.

My dressing is essentially the same as Dr. Knapp's.

It appears to me that those who advocate iridectomy hold that in order to get the lens out, you have to tilt it on its axis into the anterior chamber. Those of us who practice simple incision know that in the majority of cases this is not so, the iris slides up into the incision, the pupillary space corresponds with the incision in the cornea, the lens slides through and the iris drops back into the anterior chamber.

In regard to Schweigger's statistics I would say that they are different in his hospital and private practice. His percentage of successes is larger in private practice. Those who have visited his hospital know what some of his cases are.

I agree with Dr. Noyes in regard to what he has so well said in reference to our fear of the iris. I do not hesitate to return the iris forcibly, within reason, with a spatula and to

repeat this two or three times if there is a tendency to prolapse. I do not hesitate to drop a solution of eserine, one grain to the ounce on the prolapsed iris. I have yet to see any untoward result follow these procedures. Of course I prefer not to do it. I have frequently followed the suggestion of Dr. Knapp, although I have not used the probe. I have taken the point of the spatula and rolled the periphery of the iris from beneath the limbus, and at the same time I try to remove any little fragments of cortical substance from the wound.

As far as the results from extraction of the capsule are concerned, I think that they compare favorably with those of other operations. If there is any little remnant present, I do not wash it out. I do not find a slight degree of simple iritis of any importance except occasioning a slightly prolonged retention of the patient. I escape it in a large proportion of the cases. As far as adhesions of the capsule are concerned, I have no doubt that in this operation we get them more frequently than we know anything about but the ordinary degrees of contraction and dilatation of the pupil under the natural influences of light is so small that in a large proportion of cases there is no teazing of the iris. If there be moderate adhesion, I do not think that it is as important as the danger of subsequent decision in many cases. That we may have to incise the posterior capsule, is well known.

Dr. X. C. Scott:—In regard to one of the cases reported as benefited under medicinal treatment, I would say that I saw the case a year ago. One eye was almost obscured by cataract and the other eye was very defective. The patient also informed me that there had been a gradual increase of the defective vision from the time it began to fail.

Dr. J. E. Minney, Topeka, Kan.:—I think that the simple operation requires more manual dexterity than where iridectomy is done. I have had one case in which prolapse occurred on the third or fourth day, and as Dr. Knapp has suggested, I allowed it to remain. The man's vision is excellent, but I am in constant dread of trouble.

I would take exception to one remark of Dr. Noyes in regard to iridectomy. When a man is called to a patient and does not prescribe any drug, he is expected to give a reason for not doing so. I do not think that the burden of proof rests upon those who do iridectomy, but upon those who do not do it.

Dr. B. Alexander Randall, Philadelphia:—If one must give a reason for continuing to do iridectomy, many of us will have to give as one reason, lack of that skill which comes from a large number of operations. Therefore I continue to do iridectomy.

In regard to the medicinal treatment of cataract, I have had some experience with my friend Dr. Risley, and have also myself followed a series of cases, not very large but distinct, where the swelling of the lens and the deterioration of vision was evident, and where I had myself seen the spicules encroach further upon the pupillary space. Yet I have seen such advancing conditions take on a retrograde change, the vitreous clear, the vision improve, and the lens, if not becoming more clear, certainly growing no more opaque nor swollen and productive of a fictitious myopia; and for a term of years this improvement has remained under treatment of a medicinal character.

Dr. Samuel D. Risley:—I think that the criticism of Dr. Erwin's paper grows out of the fact that he has not reported his cases fully. He has left the impression that the cataracts were cured, which I doubt very much if he intended to do. Some time ago I published a long series of carefully studied cases of incipiens, some of which I had followed for ten or twelve years, and last year read a second paper on the same subject before the Section. Dr. Noyes' remarks accord with my own experience. These cases must be placed in two classes. I have watched the opaque masses in the periphery for a long time and there has been no increase. We are all familiar with this large group. The claim which I made in my paper of last year was that the typical cataract was, in a large number of cases, not justly regarded as a senile change, but was the result of impaired nutrition of the eye, and that if the change were due to this cause, by improving the health of the eye by wisely directed treatment, we might retard the onward progress of the opacity of the lens. This experience has demonstrated the possibility of doing in a certain number of cases. Quite a large percentage of the cases reported went on to maturity, but many were retarded and still enjoy useful vision. There is one other point in favor of the treatment of incipient cataract, and that is, even if the onward progress is not arrested by the treatment, the eyeball is healthier and better able to withstand the trials of operation. I therefore feel that there is a field for study in this direction, and one which we should not altogether ignore. I wish to reiterate, however, that while I have again and again seen the anterior chamber grow deeper as the swelling of the lens subsided in incipient cataract, I have never witnessed the slightest diminution in any spicule of opacity in the lens under any method of treatment.

Dr. A. J. Erwin, Mansfield, O.:—You have doubtless observed that I do not suggest medication as a substitute for surgical interference in mature cataract. My distinct proposition is this, that where the existing vision is equal to the average vision that we get after extraction, it is better, all things considered, to save the lens with the vision as long as possible, for the reason that you not only save the patient the anxiety and distress of the operation, but also the risks that necessarily attend operations. Furthermore, there are many cases that could not be safely operated if ripe, and many others advance so slowly that the patient would be kept in comparative blindness for many years before an operation could be made. True, by medication the hundreds are not made by one fell swoop, as it were, like we do in extraction. Such treatment as I suggest takes time and work, but in our profession that should not be an objection. But the great obstacle to medication in cataract is the all-pervading surgery fad, and then it is so brilliant and so courageous to be a surgeon that one likes to forget all other therapeutic measures. I doubt, therefore, whether our more eminent oculists have either the time or inclination to give incipient cataract that long continued, attentive treatment as suggested in my paper, necessary to stop the advance of the disease. In answer to the criticism of an illustrious compeer from New York, whose book we read and whom we delight to follow, it is only necessary to say that he has, in his remarks, adopted the illogical method of thrusting an opinion upon this Society as a climax, after acknowledging that he had no experience in the medication of cataract. It is entirely gratuitous for any man to say that this or that therapeutic measure is worthless, unless he has carefully and persistently tried it. In the science of medicine the time is past when any man's opinion has either weight or value unless based upon observed facts. Hypothesis is nothing, opinion is nothing; facts alone count now.

I am glad my friend from Cleveland had the opportunity of examining Mr. Swineford, one of the cases in my report, five months later than my last examination. He has just informed me that the vision of his right eye was still good, but that he was nearly blind of the left, though not ripe, well, 2-200, as in my report, is probably about what he found. I do not pretend to say that these cases are permanently cured, or rather permanently checked, nor do I know that this treatment will permanently arrest the advance of cataract in any case; but I do believe that nearly all cases of incipient cataract can be arrested for at least a few years, and in many cases to the end of the lifetime of the individual, by these measures.

Dr. H. Knapp, of New York:—In regard to discarding the bandage and restraint, I think that Dr. Chisolm will agree with me that rest is one of the prime factors in obtaining primary union, so that it is merely a matter of compromise between the old roller bandage and other appliances for securing greater rest for the eye. If we could have secured greater rest with the roller bandage I should have kept it, but it was necessity that led me to the abandonment of this cumbersome dressing. In Heidelberg, I had little trouble in keeping the roller bandage on my patients. It seems that nationality has something to do with it. Put a roller bandage on the eyes of a restless patient in a New York summer, the next morning you will find it over the ears. This is worse than no bandage. In summer I use the simple bandage of which I have spoken. This gives me occasion to mention an appliance which has been used in Vienna for many years and advocated also in this country as a protection of the eye from traumatism. It consists in a mask of metal wire placed over the eye. The objection is that the wire moves with the roller and the stiff corner of the mask gets into the corner of the eye, doing more mischief than good.

So it is with the roller bandage—good in principle, unreliable in execution.

Another thing of which I want to speak is why I and many others, have abandoned iridectomy as a rule. Iridectomy is certainly advisable in a number of cases, preventing accidents that are worse than the enlargement of the pupil. I must say that I might have done more iridectomies than I have done—ten per cent. Dr. Chisolm says in advocacy of

his isinglass plaster that he has no greater number of cases of prolapse, but in his last report there are thirty-three per cent. of iridectomies. The iris which is cut away, cannot prolapse. The number of intercurrent iridectomies in the simple operation must come into consideration.

Dr. J. J. Chisolm, Baltimore:—The report to which Dr. Knapp refers is a hospital report in which are included cases done by my assistants and they do iridectomies. The hospital report does not refer to my individual cases.

Dr. H. Knapp, of New York:—The danger in the simple operation comes from the prolapse of the iris, as it does in the combined operation and the danger from prolapse in the combined operation (the angular incarcerations) according to my experience is greater than the prolapse in the simple operation. Since I abandoned iridectomy, I have seen much less iritis, irido-cyclitis and other complications than before. Simple extraction is, I think, the safest operation and that is its principal claim. When I examine eyes on which extraction with iridectomy has been done by myself or others, I find incarceration of the iris in the corners not so rarely and incarceration of the capsule in the majority of cases. This leads to many reactive processes including sympathetic ophthalmia.

I never cut a prolapse, whether spontaneous or traumatic, unless I get it fresh. If there is blenorrhœa or another infective process, it is criminal to cut a prolapse, as this opens a door for the entrance of germs into the interior. These are only the immediate results of cutting the iris, but the later ones are just as deleterious. In the series of one thousand combined operations which I have reported, there were two or three cases of late suppuration following incarcerated iris. In some cases the incarceration was so small that it could not be seen. As a result of exposure there was purulent iritis and ophthalmitis in eyes that had been quiet for years. Such cases are well known. The danger from immediate prolapse of the iris is greater when the iris is cut than when it is left untouched. Some years ago while engaged in experiments with infective germs, I injected pyogenic cocci into the anterior chamber of rabbits. On examination of these eyes I found the cornea was full of germs, but the iris almost free from them. The iris protects the deeper parts. This fact may serve as a rule for guidance, that we should make an iridectomy only when the eye is still aseptic. Otherwise it is better to postpone the operation until all inflammatory irritation past.

The occurrence of prolapse is chiefly due to two things. The one is *traumatism*. In fifty per cent. of the cases there is a direct history of hurt or blood in the anterior chamber to indicate that the part had been injured. The second cause is a *peripheric section*. The introduction of excision of the iris was not the result of scientific thinking. Iridectomy was made because its originators could not help it. A large peripheric incision without iridectomy is impossible. This is not so when the section is placed in the limbus. As we cannot always be accurate, let us rather encroach upon the cornea than on the sclerotic. On the whole the subject is certainly one that still requires careful study and prolonged experience.

DOUBLE CONGENITAL DISLOCATION OF THE LENS.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY GEORGE FRIEBIS, M.D.,
OF PHILADELPHIA.

On Jan. 3, of this year, the Rev. Dr. B. of Philadelphia, brought his son Walter, now 7 years of age, to me desiring that something be done to improve his sight; stating that for some time past both he and the teacher had noticed that the boy had great difficulty in clearly defining objects, which were easily distinguished by other pupils of his class, at a reasonable distance from him, nor could he well define small letters at the usual reading distance. The examination revealed the rare condition known as congenital dislocation of the lenses; and in this instance the dislocation was symmetrical. I have the honor to show you an excellent drawing, made by Dr. J. Madison Taylor, of Philadelphia, illustrating the conditions. The lens in each eye was tilted upward, slightly backward and inward. The iris was responsive to light stimulation and only on close scrutiny could a slight tremulousness of the same, in the inferior, outer quadrant be detected. The fundus viewed by both the direct and indirect methods showed the curious phenomenon of aphakia with myopic refraction in both eyes. The lower periphery of the upward dislocated lens appeared as an irregularly marked black line. The fibres of the zone of Zinn, described by some observers upon the subject, as clearly discernible in the aphakial interspace, were absent in this case. Owing to the child's unsteadiness it was impossible to measure with accuracy the degree of refraction either of the lens or aphakial portion of the eye. I confess to have been slightly puzzled by the appearance of the lens, viewed by oblique illumination, deeming it at first glance, because of the strong grayish reflex of the lens, though entirely transparent by other methods of examination, a form of congenital cataract. The vitreous body and fundus were normal; the tension likewise. The test for vision in the R. E. = 15-70, L. E. 15-50 imperfectly; a manifest refraction at this time, which was rather hurriedly performed, gave a negative result. Upon a subsequent occasion, the pupils being dilated by atropine, I thoroughly tested his vision with different combinations, spherical, cylinders and sphero-cylinders + and — which would be too wearisome to enumerate; I found the following formula gave the best results. R. E. S. — 1 = cyl. — 1 ax. 180 = 15-70 clearly, but in a moment he would again lose certain letters in the line. L. E. S. — 1 = 15-50 perfectly but as in the R. E. he could not hold the line satisfactorily. A few weeks later on, I again tested his refraction without mydriatic or glasses. At this time vision for distance in the R. E. = 15-70, L. E. 15-50 imperfectly, these tests proving conclusively that the child was also amblyopic; a usual concomitant of congenital dislocation. Vision for reading was not improved by glasses in the slightest degree. In fact vision for small letters at about 8 inches was slightly better without glasses and he defined letters Snellen 1 at 8 to 10 inches fairly well, but had to search for them, this showing an amplitude of about 2 inches in each eye and that accommodation was not entirely abolished. Glasses were not prescribed. The field was tested and found to be normal; the color sense was unimpaired. Diplopia usually present and demonstrable in many cases of this character could not on account of the youth of the patient and some mental obtuseness be established.

In passing I would state, that Dr. Chas. S. Turnbull also saw this little patient with me but by no method of examination could we detect any other structural changes than those already mentioned. Both parents are healthy and have a family of nine children, all of whom have excellent vision. As some observers hold that congenital dislocation is largely due to heredity and that consanguinity often plays an important part in its causation, I closely questioned the father, a very intelligent man, as to his family history. I could not obtain a satisfactory answer confirmatory of his theory, but he stated that he had no definite knowledge of any hereditary tendencies in his wife's family. The late Dr. Wm. S. Little of Philadelphia, reported at the 19th meeting of the A. O. Society two cases of congenital dislocations of the lens, one was non-symmetrical and the other symmetrical. The latter case occurring in the practice of Dr. Turnbull, by whose courtesy I am enabled to show you an additional cut representing a double inward dislocation. Although this cut was shown at the meeting of the American Ophthalmological Society in 1883, yet I deemed it of sufficient interest, by way of contrast with my own case, to bring it to the attention of this meeting. Both patients were likewise markedly amblyopic and in each instance refraction of the existing ametropia gave a useful degree of vision. In Dr. Turnbull's case the lenses were so far dislocated as to make the eyes almost aphakial, but by the use of cataract glasses useful vision was obtained. Dr. Turnbull's patient gave no history of malformations in any of the members of his family or near relatives, but had himself a highly vaulted roof of mouth. Dr. Little's patient said that he had a cousin similarly affected and that

his father was color blind. These are the only two cases that I have been able to find in the more recent literature within the past decade, clearly recorded as congenital dislocations, although foreign literature teems with a goodly number of this congenital aberration. Dr. Doensch in an admirable monograph enters at some length into the history of the subject, in which it appears, that earlier writers made no marked distinction between congenital and spontaneous dislocations, both being looked upon by the majority of observers as indicative of a morbid process. Not until Sippell's excellent essay upon the subject, who was himself afflicted with congenital dislocation, was a distinction made and the diagnosis accepted, that one was a morbid condition in which the lens was liable to further degeneration, such as sinking of the lens and loss of transparency, etc., while congenital dislocation is a permanent condition not likely to undergo such changes, and in which heredity and consanguinity are the most probable etiological factors. In support of the theory of heredity, Sippell quotes a number of cases, three of von Graefe's and three of his own, in which the condition was found to exist in one instance and in the others traceable to father and daughter. Graefe, Sippell, Dixon and other authors give strong support, in my opinion, to the heredity theory; a number of cases are reported of brothers and sisters of the same family, who were so effected. In Jonathan Wild's interesting little book on "Congenital Malformations of the Eye," which was kindly brought to my attention by Dr. Oliver, a member of this Society, I found four cases, which he quotes from Dixon, all occurring in the same family, and though the history of the case presented by me does not sustain the theory of heredity, it is but an isolated case and an exception to the rule, and my conclusions based upon a brief study of the literature of the subject, I would formulate as follows:

First, that congenital ectopia lentis is usually double.

Second, that it is a congenital malformation, the cause of which is not yet positively established.

Third, that amblyopia and ametropia are always concomitant conditions and that the majority of cases, so far reported, sustain the theory of heredity as the primary cause.

Discussion.

Dr. D. C. Bryant, Omaha:—I have under my care a family of seven persons, five of whom had the same trouble, dislocation of the lens. The parents have healthy eyes. In another family the mother and three children suffer with the same trouble. There is no myopia in these cases.

Dr. B. Alexander Randall, Philadelphia:—I remember seeing two cases of this condition it Jeager's clinic on the same day. In one the dislocation was up and in the other up and to the left. The point was made by Jeager that he regarded the symmetrical displacement as congenital, and the other as probably of traumatic origin; and I would ask if those of wide experience can throw light upon this question, which my own observation would leave an open one.

Dr. Edward P. Morrow:—It has been my fortune to see four cases of dislocation of the lens and to receive the history of another in the same family. The drawing shown is a perfect picture of the first case seen, a boy about 12 years of age having a double dislocation upwards and inwards. Shortly following this his sister presented herself, showing precisely the same condition, again inside of the year another sister and the mother similarly affected. From the mother, a history was obtained of her sister, whom she said was affected in a like manner. Each of these cases would accept either a convex or a concave lens with slight improvement of vision. There was no movement of the lenses obtained in any of the cases.

Dr. Eugene Smith, Detroit:—It may be of interest to speak of a case of voluntary dislocation of the lenses that has come under my observation. When the individual tipped his head forward both lenses would come through the pupils, when he threw his head back the lenses would return. I advised iridodesis and in the meantime used eserine. He went to New York where operation was advised against and pilocarpine prescribed.

Dr. George Friebis, Philadelphia:—The remarks which have been made are corroborative and sustain the views I have expressed, that heredity is the most prominent etiological element in the production of this condition.

INFANTILE CATARACT.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY ALBERT R. BAKER, M.D.,
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I selected this subject, not because I had any new facts to communicate or new operations to propose, or new theories to advance; but because my experience, observation and reading has led me to believe that, as a rule, we do not treat infantile cataract as successfully and as intelligently as we do many other eye diseases. If I am correct in this supposition, an interchange of ideas on this important subject at this time cannot fail to be of value.

I know of no subject more perplexing to the medical student than the classification of cataracts; they have been classified as to age as congenital, infantile, juvenile and senile, as to consistency as fluid, soft, mixed and hard. They may be capsular or lenticular. Capsular cataracts may be pyramidal anterior polar, posterior polars, or degenerative. Lenticular cataracts may be nuclear, cortical or zonular. Cataracts have been classified as to cause, as albuminuric, diabetic, traumatic, etc. They may be simple or complicated, primary or secondary, ripe or unripe, mature, immature or hypermature. This list might be continued almost indefinitely, but is sufficient to illustrate the protean forms in which lenticular opacity presents itself to the ophthalmic surgeon, and it is in the child that we find the most remarkable variation, in the cases brought to our notice. It was that prince of British ophthalmologists, Mr. George Critchett, in a lecture published in the *London Lancet* as long ago as 1855, who said that "Congenital cataract deserves very careful notice on account of the numerous aspects it assumes, the frequency with which it is overlooked, the baneful influence it may exert upon the prospects and career of the patients, and the favorable results of suitable treatment. The more we have an opportunity of observing these cases, the more evident does it become that nature revels in variety. Even in her morbid operations, when we fancy we have exhausted every possible form, some new manifestation presents itself."

For our present purpose it is not necessary to enter into an extended discussion of that much debated question, whether cataract is ever congenital, as it makes little practical difference (although the question may have an etiological value), whether it is present at birth or comes a few hours or days afterward. Dr. Alt[1] saw a case of total lenticular cataract in a baby 24 hours old. The writer saw a milky white

[1] American Journal of Ophthalmology, December, 1887.

lenticular cataract of one eye, other eye normal, in a child 24 days old. The mother and an intelligent nurse said the opacity was present at birth. Granting that cataracts may be congenital, it seems to me more desirable to substitute the term "infantile cataract," so as to include all those occurring in infants and young children. Practically many of these cases do not come under the observation of the oculist until later in life, often being overlooked until 5, 10, and even 15 or 20 years of age.

The most frequent form of infantile cataract is the lamellar or zonular. These cases are not infrequently associated with other congenital defects, the intellectual faculties often being very imperfect. Mr. N. C. Macnamara,[2] in his Presidential address to the Ophthalmological Section of the British Medical Association, remarked, in opening the discussion of this subject, that "it was well known that in fœtal life branches of the hyaloid artery covered the posterior surface of the lens, and advanced forward over its margin, helping to form the membrana capsula pupilars. If, from fault in the development of the eye, this vascular layer persisted after birth, it was apt to give rise to a film of connective tissue, extending to a greater or less extent over the posterior surface of the lens, and so forming a zonular cataract. In some instances a small patch alone was left to mark the spot at which the hyaloid artery had passed on to the lens, in other cases a central opacity existed, with radiating bands stretching toward the periphery of the lens. Microscopical specimens have demonstrated the fact that some of these zonular cataracts consisted of a film of connective tissue, together with remains of the hyaloid artery." This seems to be the most satisfactory explanation yet offered of the pathology of zonular cataracts, and it seems much more rational to attribute the convulsions which have figured so largely in the literature of this subject to the same cause which brought about the defective development of the lens, the defective mental faculties, and the other bodily defects so frequently seen in these cases. An attempt was made to secure statistics bearing upon the relative frequency of cataracts associated with hare-lip, cleft palate, coloboma of the iris, total absence of iris, spina bifida, etc.; but could find nothing satisfactory. I regret exceedingly that I have not kept more accurate records of these cases occurring in my own practice, and yet the experience of any one man, unless he had exceptional advantages for observation, would not include enough of these cases to be of much practical value. Upon referring to my case books I find records of only two cases of congenital total absence of the iris, and in both of which cataracts were present. One of these had interstitial keratitis and typical Hutchinson teeth. The other was confined to a penal institution and a confirmed criminal. One lens was partially dislocated, and by throwing his head backward in a peculiar jerky manner he could throw his lens partially back like a door, out of the visual axis, and thus secure a fair amount of useful vision. He said his father's eye had just the same appearance. Of nine cases of coloboma of the iris two had cataract. I have met with two cases of cataract associated with hare-lip, and one with spina bifida, and a number of cases had Hutchinson teeth.

If time permitted, it would be interesting to consider hereditary influence in the production of zonular cataract. A few years since I was called to operate upon three brothers, aged respectively 11, 21 and 29 years. There was one other son and three daughters in the family whose eyes are normal. The parents were cousins and one grandparent had senile cataract, otherwise the family history is good.

Next frequent to the zonular in infants is the anterior polar or pyramidal cataract. Notwithstanding the great diversity of opinion as to the etiology of these capsular cataracts, I have no doubt but that they are nearly all due to a perforation, or at least inflammation, of the cornea. It is not necessary that any corneal opacity should be present. About two years ago a child was presented at my clinic, 2 months old, with a history of having had a severe attack of ophthalmia neonatorum, with perforation of both corneæ. There was a dense white corneal opacity, including nearly the whole cornea, so that it was impossible to see the pupil of either eye. In the course of a few months the corneal opacities cleared up so that typical anterior polar cataracts could be seen, which were removed by the suction operation. At present there is no corneal opacity, and it would be impossible from any examination to say that there had been a perforation. It is surprising that so accurate an observer as Dr. Alt[3] should not have seen such cases.

Not infrequently the lens undergoes degenerative changes, its fluid constituents become absorbed, leaving behind a tough dense membrane often containing more or less calcareous substance. I have met this condition most frequently in traumatic cases or in cases which have been operated upon repeatedly by the needle operation. I have come to look upon the usual needle operation as a frequent cause of this condition. How often after needling an infantile cataract several times have you found the pupil still occluded with the dense white remains of the capsule and shrunken, possibly calcareous lens, through which you have been able with great difficulty to tear a hole—a poor excuse for a pupil, but you congratulate yourself upon securing even that? This has been my unfortunate experience so frequently that I have almost abandoned the needle operation in cases of zonular as well as in pyramidal cataracts. After trying several operations my preference is for the linear extraction combined with the suction operation with Mr. Teale's instrument, in which the suction is made by the mouth of the operator. I have never been able to get a Bowman syringe that I could use so well.

The anterior capsule should be divided in both the verticle and horizontal meridians the full extent of the dilated pupil, and the lens pretty thoroughly broken up, but avoid perforating the posterior capsule. Keep the pupil well dilated, and in from three to five or six days, possibly seven, make a broad incision at the outer part of the cornea about two or three lines from the sclero-corneal margin, with the keratome. In many cases by partially withdrawing the instrument and pressing it backward, and as the aqueous escapes, the softened lens matter runs out almost of its own accord, the remaining portion if any, can often be coaxed out with a little stroking of the opposite side of the cornea with the spatula. If there is a hard nucleus it can be delivered in the usual manner. If the pupillary area can not be thus readily cleaned the suction curette can be inserted,

[2] British Medical Journal, September 12, 1891.

[3] American Journal of Ophthalmology, December, 1887.

and by sweeping it around carefully the remaining cortical substance can be removed. Care should be taken not to injure the iris. In one instance in which I made the incision near the sclero-corneal margin, I had a slight anterior synechia, and the pupil is slightly oval in shape, but otherwise there have been no untoward symptoms. Since this accident occurred I have made the incision in the cornea further forward, and the danger of synechia is lessened, and the lens substance removed more easily; mydriatics can be used much more freely so as to keep the pupil well dilated without danger of prolapse. By this method patients are discharged in from two to three weeks, which under the old method would have occupied months, and often valuable time in the child's education sacrificed. In very young children on account of the difficulty in managing the patient, it may be preferable to resort to the needle operation. In these cases there is not the same necessity of securing useful vision at once, and yet in cases showing a disposition to develop nystagmus, I very much doubt the propriety of wasting time to allow the lens to absorb when it can be removed so easily. The lens however, is absorbed much more quickly in those cases than in older children. I have followed the rule applicable to senile cataract, and operated but one eye at a time, and have several times questioned the advisability of making an iridectomy, and of permitting the lens to remain in one eye so as to allow of a certain amount of accommodation for near work.

I have under my care now, a bright little boy six years of age, whose vision in left eye was $\frac{5}{200}$ increased by dilating the pupil to $\frac{15}{200}$, in the right eye $\frac{20}{200}$ with pupil dilated increased to $\frac{20}{70}$. I removed the lens of left eye by the method detailed above, and secured vision $\frac{20}{30}$ with + 10 D. Before the operation there was considerable nystagmus which has all disappeared. When the pupil of right eye is dilated with cocaine he can read Jaeger No. 3, and has considerable amplitude of accommodation, especially for larger type.

I should be pleased to know if any of the members of the Section have had any experience in this direction. Would the amount of accommodation in such an eye be of any practical advantage to the patient, and if so, would it be enough to compensate for the deformity of an iridectomy?

Would there be any objection to postponing farther operative interference until later in life, when the patient could express an intelligent opinion on the subject?[4]

It has been my custom to recommend operation within the first year. I operated upon one case at two months. There are cases which it may be advisable not to operate upon at all.

A doctor friend of mine has a typical anterior polar cataract of both eyes, so prominent are they, that he always wears colored spectacles when in company, to hide them. He completed a regular collegiate course, graduated in medicine, and is now doing a large general practice.

If operative interference is decided upon, the question is to be answered whether the lens is to be removed or an iridectomy is to be performed.

I have followed the rule laid down by my old instructor, Mr. Streatfield, and removed the lens in all cases in which the vision could not be improved, by suitable correction of refractive errors, with the pupil widely dilated to $\frac{20}{60}$. Practically, this rule has left but few cases for iridectomy, and those cases in which I have made this operation have been rather disappointing in results, and in several instances a subsequent removal of the lens became necessary.

In conclusion I will offer the following for your consideration:

1. Infantile cataracts should be operated upon early, within the first year if possible.

2. In pyramidal and zonular cataracts in which vision cannot be improved to $\frac{20}{50}$ after fully dilating the pupil, removal of the lens is to be preferred to iridectomy.

3. Fluid cataracts are best removed at once by linear extraction.

4. Soft cataracts including zonular and capsular, are best treated by first breaking up the lens thoroughly, and removing a few days later by the combined linear extraction and suction operation.

5. Simple decision is sufficient in very young infants, unless nystagmus should be present.

6. Only one eye should be operated upon at a time.

7. There are a few cases in which it may be advisable to extract one lens for distant vision and make an iridectomy on the other eye, so that a certain amount of accommodation may be preserved for near work.

143 Euclid Ave.

Discussion.

Dr. B. Alexander Randall, Philadelphia:—The point was raised in the paper in regard to zonular cataract as examined with the microscope, that a portion of the hyaloid artery of the fœtus had been traced into the cataractous zone. This matter has escaped my observation, and is contrary to anything that I have studied in the matter. I would ask if I heard aright. The hyaloid artery with its capsular and pupillary net-work is wholly external to the lens-capsule, and I cannot conceive of its having any connection with the opaque laminæ of lens-substance within.

Dr. A. R. Baker, Cleveland, Ohio:—I have presented this paper not so much because I had any new ideas to advance as with the hope of gaining some information upon the points presented. In reply to the question of Dr. Randall, I would say that I am indebted to Macnamara for that point in regard to the remains of the hyaloid artery being present in these cases He says that microscopically, remains are to be seen in many of these cases.

INJURY TO THE LENS WITH CASES.

Read before the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, at Detroit, Mich., June 7, 1892.

BY B. L. MILLIKIN, M.D.,
OF CLEVELAND, OHIO.

I desire very briefly to call your attention to a class of cases of great frequency, especially in large manufacturing districts, and which we are all continually being called upon to treat. In few text books do we find any adequate consideration of this important subject, and I scarcely know of any English work on Ophthalmology which is particularly explicit about injuries of the lens, or lays down good rules for the management of such cases. While time will not permit us to enter upon a full discussion of the topic, I have thought the consideration of a few of the more important points might not be without interest to us as specialists or as general practitioners.

Few things are more demoralizing to a patient than

[4] I think Mr. Critchett suggested this procedure many years ago, but I could find no record of cases in which it was practiced.

to suddenly find he has lost his eyesight, and few accidents can more excite our sympathies.

From a clinical standpoint we may divide the injuries of the lens into two classes, viz: those where the chief injury is to the lens mass itself, and second where there is, in addition, a grave lesion of other structures of the eyeball, the latter class comprising a much larger proportion of all the cases with which we meet. In the first class are comprised such injuries as bits of steel or iron lodging in the lens substance, spicules of iron penetrating the cornea and the lens, but not remaining,etc., and these producing very different lesions,depending upon their size,form and the force with which they enter the eye. When these penetrate the lens and enter the vitreous humor, another class of complications arises, depending upon the ultimate lodgment of the foreign body. The second class of cases comprises a series of injuries of great importance and variety, depending entirely upon the structures involved, the most serious of which are those associated with injuries to the ciliary body, which are always very grave; also, the results of injuries due to puncturing substances will depend materially upon whether the foreign body remains within the eye, or not. The seriousness of the injury of the lens will likewise vary according to the age of the patient, destructive changes being much less likely to occur in young patients than in those older. Almost all injuries of the lens are liable to terminate in traumatic cataract, more or less complete, depending upon the amount of disturbance of the lens substance, and especially the capsule.

In the early history of an injury to the lens, the diagnosis is usually not difficult, and by dilating the pupil with a few drops of cocaine or homatropine, a clear view of the lens with the ophthalmoscope, or with the oblique light will usually serve to locate the position of the foreign body, if present. If, however, there has been in addition, extensive injury to the iris or ciliary body, the location becomes difficult, or impossible, depending upon the amount of hæmorrhage and other disturbances to the structures. A day or two after the injury, even in cases where the foreign body has been very minute, with the ophthalmoscope the course of the foreign body may be made out by a line of opaque matter in the lens, so that one can very readily trace through this substance the course of the offending body.

The progress of the development of traumatic cataract varies greatly in different cases, usually depending, in all probability, on the extent of the lesion of the capsule. Very often the extent of the opaque portion of the lens changes rapidly, and frequently opaqueness of considerable extent will be rapidly absorbed, leaving the lens clear. Sometimes a spicule of iron which penetrates far into the body of the lens will leave no prominent opacity, the track clearing up completely, as in one of the cases which I shall report. In other cases, an opaque line, marking the course of the foreign body may remain for years, and if near the periphery of the lens, will produce no permanent interference with vision. I have selected the following cases as illustrating various injuries of the lens, and which may serve as types of a very large class.

Case 1.—On the 2nd of July, 1888, V. L., æt. about 40 years, a machinist, was struck in the left eye by a long sharp splinter of steel,which was pulled out by a fellow workman. The foreign body entered the eye just below the lower border of the pupil, perforating the iris, and penetrating deep into the lens. Just after the injury, vision was diminished very considerably, but at the time of the examination, he had the following vision: O. D. V. = 6-6 ? O. S. V. = 6-9 ? Under a few drops of a solution of homatropine the pupil dilated irregularly, and only to a slight degree, although the drops were used several times. On the cornea was a speck or scar marking the entrance of the foreign body, and directly behind it a point in the iris, but with the ophthalmoscope I was unable to detect, at the time, any evidences of penetration of the lens. Atropia was prescribed, to be used three times per day, and a compress and bandage applied. On the following day the pupil was found to be irregularly dilated, being adherent in the lower portion to the capsule of the lens. The ophthalmoscope showed clearly a line of striation, the opacity through the lower portion of the lens being very perceptible. A week later the eye was much better, and showed but little opacity in the lens, only a fine striated line through the lower edge of it where the foreign body had penetrated,and the pupil was dilated ad maximum. Vision was normal.

Case 2.—I have reported this case in full elsewhere,[1] and shall here only refer to the points of interest in this connection. On the 18th of March, 1871, a piece of cap from a musket entered the eye of E. M. O., now æt. 33 years, penetrating the cornea at the outer margin of the right eye, cutting through the iris to the outer border of the lens. At the present time, his vision, after the removal of the foreign body from the posterior chamber, is sufficient for all ordinary uses. The ophthalmoscope shows, in the line of the wound through the lens, a dense white opacity, simply covering an area as large as the original injury to the lens structure must have been, and in all these years there has been no additional development of the traumatic cataract.

Case 3.—The following is an example of a very frequent accident. H. T., about 12 years of age, while shooting a small toy cannon, received an explosion of powder in the face, the eyes being thoroughly peppered, and many pieces were removed from the cornea of both eyes. The corneæ were so opaque that a careful examination of the anterior chambers was difficult or impossible. Three weeks after the injury, when the corneæ had cleared up, it was found that a small grain of powder had entered the anterior chamber of the left eye and evidently wounded the capsule of the lens,having also penetrated the pupillary border of the iris, this being found attached to the capsule, with a considerable area of the lens adjacent to the foreign body opaque. Under the alternate use of atropia and eserine the iris was almost completely separated from the capsule, and the lens matter has gradually cleared up, until at the present time there remains only a slight opacity on the capsule, with the small powder grain still showing, and V. = 6-6 ? although the opacity is located just at the lower border of the pupil.

Case 4.—On the 18th of May, 1891, Miss E. B., æt. about 20, came to me with the following history: On that morning, while passing through a field, and over a barbed wire fence which had fallen to the ground, she felt something strike the right eye, which she thought might be one of the barbs of the wire, but was unable to say definitely. Immediately she noticed that she could not see, and this was followed by severe pain in the eye and head. Upon making an examination, I found in the centre of the cornea a vertical wound, ragged in appearance, perforating the cornea, some of the lens matter having escaped into the anterior chamber. T = − 2.

Atropia was instilled into the eye, and a compress and bandage applied, after carefully cleaning the eyeball and lids. On the following day the pupil was well dilated, regularly, and the ophthalmoscope, and oblique illumination showed clearly the wound in the cornea and in the capsule of the lens just below the centre, with the extruded lens matter, which was very slight in amount. The lens showed a number of striæ, running from the centre regularly to the periphery, like the spokes of a wheel. On the first of June following, the striæ in the lens were clearing up, very evidently being smaller and less opaque, while the spot in front of the lense was smaller, and the lens matter in the anterior chamber had entirely disappeared, leaving simply a large spot in the front of the lens and capsule. She then counted fingers at eight feet. By the 28th of August, nearly all the striæ had disappeared, leaving only a small roundish opaque spot in the lens capsule, together with a corneal scar, and the pupil was fully dilated. I have since heard, but have had no opportunity of making an examination, that the

[1] Trans. Am. Oph. Soc.,Vol. V, p.565, et seq.

vision of the eye had again failed. Probably there has been a redevelopment of the traumatic cataract.

Case 5.—The following case is of interest on account of a somewhat similar accident occurring to each eye at considerable intervals. On the 3rd of April, 1890, I was called in consultation to see J. D., æt 21, from whom I elicited the following history: Ten days ago he was struck in the left eye with an iron burr, which produced a lineal wound of the cornea, evidently cutting or rupturing the capsule of the lens, as there was much inflammation of the eye; but it is now quiet and he has not had great pain. T = n. Lens is swollen up very largely, filling almost completely the anterior chamber, and attached to the edges of the pupil; pupil fairly well dilated under atropine. Under cocaine, the lens matter in the anterior chamber was removed by an upward incision with the keratome, leaving the pupil fairly clear, but still some cortical matter remaining. Atropia was used to keep the pupil dilated, and a compress and bandage applied for a few days. On the 2nd of May following, there was considerable opacity in the pupillary space, so that the details of the fundus could not be made out. Under cocaine another operation was performed breaking up the soft lens matter and slitting up the capsule, after which patient could see fingers readily and the eye continued to do well. At present, with +14.00 D's glass V = 6-6?

On the 6th of April, 1891, while working in boiler works, he was again struck with a bit of steel, in the right eye, which produced a vertical wound through the corneo-scleral junction at the lower outer quadrant, and the anterior chamber was filled with blood. Three days later, an examination with oblique light disclosed striæ in the lens; pupil partially dilated with atropia, but eye doing very well. Evidently the traumatic cataract was developing rapidly, with little or no pain. By the 14th of May, the eye had improved very satisfactorily, the wound being well closed, the irritation having greatly subsided, leaving the pupil somewhat irregular in shape with attachments in the region of the wound. The ophthalmoscope showed the middle portion of the lens clearing, but with a more dense opacity directly behind the seat of the injury. Two weeks later the lens had cleared up almost entirely in the central portion, leaving the opacity confined to the neighborhood of the injury, and the outlines of the fundus could just be made out with the ophthalmoscope, and V = 6-60. By the middle of December following, sight had failed very materially, and he was then able to count fingers only at six feet, and the traumatic cataract was again developing, and now had involved almost the whole lens.

Case 6.—On June 1, 1892, W. H. B., æt. 25 years, came to me with the following history: On the 26th of March last was struck in the left eye with a small piece of steel, which he thought did not enter the eye, but was unable to see after the accident. Immediately after the accident there was no pain, so that he continued his work from the time of the injury, in the morning, until late in the evening, before consulting a physician, nor has there been much pain since. The physician who first saw him sought for the foreign body, but did not succeed in removing one. A short time afterwards an operation was made for the removal of the opaque lens matter, but he has been unable to see, except bare outlines of objects in the outer portion of the field. At present the pupil is fairly clear; there is an irregular ragged scar of the cornea, probably produced by the foreign body. The iris is adherent above, and with the ophthalmoscope we are unable to see the deep structures of the eye at all, on account of the dense opacity of the vitreous. T + 1.

The eyes remain very sensitive to both light and use, in near work, to the present time. The probabilities are that the foreign body remains in the deep portion of the eyeball, and may yet give serious trouble.

As to the prognosis of all injuries of the lens, whatever may be their extent, we must consider it essentially grave, and out of all cases, very few escape without some permanent damage to the lens structure; but we believe that much can be done in the way of treatment and management of such cases immediately after the injury, or for a long time subsequently, in preserving the proper function of the lens and eye. In young persons especially is this true, and by promptly putting the organ, as well as the patient, at rest, in many such cases, great good can be accomplished. After a considerable experience with injuries of the lens, I am convinced that the rest afforded by complete paralysis of accommodation is of the utmost advantage, as protecting the lens tissue from the disturbances which necessarily must arise from the effort of using the eye.

Our treatment must be based upon a somewhat different principle in the cases of the young and the old. Of course in all cases of foreign bodies in the eye, whether the lens is injured or not, the first requisite is the removal of the offending body, if possible. The next most important step in the treatment of such cases must be the institution of absolute cleanliness, and every organ which has been so injured should be thoroughly cleansed by means of aseptic or antiseptic washes. For this purpose, simple boiled water may be used freely to wash out the eye, or solutions of boracic acid and bichloride of mercury, 1 to 5,000, for the same purpose. With the ordinary medicine dropper and any of these solutions, together with pledgets of absorbent cotton, the wound can be thoroughly cleaned, thus preventing very largely the danger of infection. One of the great dangers and sources of annoyance in all these cases where the point of injury is in contact with the iris, is the plastic adhesion of the iris to the lens, thus producing a perpetual focus of irritation, so that to avoid this tendency, I believe it is of the greatest service to use a solution of atropia sufficiently strong to dilate freely and thoroughly the pupil, and thus keep the iris out of harm's way, as well as giving complete rest from the disturbances due to accommodation. I believe that in younger persons particularly, there is little or no danger of development of glaucomatous symptoms, which some authors seem to fear so much. These symptoms are largely, if not entirely, produced by the swelling of the lens, thus forcing the iris into the outer angle. If glaucomatous symptoms do arise from the escape of the lens matter into the anterior chamber, or from its swelling due to its contact with the aqueous humor, one can readily resort to the evacuation of the contents of the anterior chamber, and so obviate the increased tension from this source. I believe it, therefore, to be the part of wise and conservative surgery, in all injuries to the eye of any considerable magnitude, to put the patient at rest—in bed if necessary—to put the accommodation completely at rest, and to put the sound eye as well, preferably by bandaging both eyes for a few days. I am convinced that by keeping such an eye completely at rest, for some weeks if necessary, very favorable results will often follow. I have no doubt that the primary clearing up of the cataractous condition of some of these cases which I have reported, has been due to the continuous use of atropia, even after all indications of the external wound have disappeared, except the cicatrices, and that the redevelopment of the cataract some months later was due to the excitation produced by the use of the organ. I could see no great objection to keeping up for an indefinite time the use of a mydriatic, without danger or inconvenience, except as may sometimes arise from its local irritation. Of course it is often difficult or impossible to maintain control of patients for a sufficient time under such circumstances. Compresses and bandages I should continue only until the external wound had healed, except in some cases where there has been much hæmorrhage, in which absorption takes place more rapidly under moderate pressure. In many cases with iritic attachments,

much can be done to loosen or break them up entirely by the alternate use of atropia and eserine, thus leaving the eye less liable to recurring inflammatory attacks.

Of the methods and time for removal of traumatic cataract, it is not necessary to speak, as our object has been rather to point out or indicate the treatment of cases prior to the necessity of operative interference.

In old people the use of mydriatics must be watched much more carefully, for in these the development of glaucomatous symptoms is very much more to be feared, while on the other hand, the condition being so much less active in these patients, this source of annoyance becomes proportionately less, depending upon the age of the patient.

Discussion.

Dr. S. C. Ayres, Cincinnati, Ohio:—I have been much interested in the paper, and particularly with that portion which related to partial opacities of the lens. I have seen quite a number of these cases, and they have always excited my surprise and interest. We are taught to believe that injury of the lens capsule is certain to produce opacity of the lens, swelling and the consequent results. I have seen a number of cases in which there were limited opacities of the lens, and in which in all probability, foreign bodies had penetrated to the vitreous, and had left limited opacities in the lens and capsule. It is not easy to explain these cases. It serves to show the healing properties in the capsule, and it shows that very often it will close up when wounded.

Dr. Edward Jackson, Philadelphia:—I was much interested in that portion of the paper which referred to the retention of vision through an injured lens. I recall one case that came to me when 82 years of age. There was a history of an injury in boyhood. There was a scar on the cornea and corresponding portion of the iris and opacity of the corresponding quadrant of the lens in which there had probably been a penetrating wound. He said that vision had not deteriorated since immediately after the injury. I watched the case for eight years longer, and the other lens was becoming more opaque, but the changes in the injured eye were not more rapid.

Another case that I have seen within a year, was one that came with a history of injury and penetrating wound with immediate impairment of vision; then subsequent improvement, followed by deterioration commencing again within two or three weeks. In this case there had been, over a year before, a penetrating wound of the cornea and iris, and I have no doubt of the lens. When the patient first presented, the details of the fundus were so far veiled that only the larger vessels could be seen. Within a month the lens was entirely opaque. This case is quite similar to one mentioned by Dr. Millikin.

The most interesting case of this kind that I have seen is one now under observation. The patient is six years of age, and has double congenital dislocation of the lens. The lower margin of the lens coming back of the pupil, prevents anything like distinct vision. There were slight opacities in the lenses. I undertook to needle one of them. I needled it four times, the last two times very freely; and within two weeks, six weeks after the last needling, there is no general opacity of the lens. Twice I passed the needle entirely through the lens, and after the operation could see its track. That track almost entirely cleared up. Just at the point where the wound was made in the capsule, a little mass of opaque lens substance projected, and in the lower quadrant of the lens there is a marked notch showing there has been some absorption, but the mass of the lens still remains clear.

Dr. G. A. Aschman, Wheeling, W. Va.:—I was much interested in that part of the paper which showed that often there is little trouble after injury to the lens. I recently had under treatment a man 50 years of age, who had lost one eye several years before. He had a ripe cataract in the other eye with a history of injury. After the injury he noticed a decrease of vision in the eye and was treated by a physician for two weeks only, when he returned home without further trouble than a gradual loss of sight. I examined the cornea carefully and found a very slight scar and as he was at an age when we should expect senile cataract, I decided to operate. I made the extraction and found in the lens a very small particle of iron. The operation was done six months after the injury, and as V. = 20-30 resulted, he was able to perform all work as well as ever.

Dr. Eugene Smith, Detroit:—I can bear out what has been said about punctured wounds of the lens occasionally clearing up without cataract or destruction of the lens. I have in mind two cases. A child ran a needle through the cornea penetrating the lens. Following this there was opacity about the size of the needle extending nearly through the lens. This entirely cleared up as did also the opening in the capsule. The child now has normal vision.

In the second case a piece of wire 1-24 of an inch in diameter was thrown across a room and struck a young lady in the eye. It went through the cornea and penetrated the lens. I expected that there would be a cataract. The opening healed up and in the course of one or two weeks the opacity disappeared. Vision is normal.

Dr. Lippincott, Pittsburg:—I have seen several cases in which injuries to the lens gave rise to very little permanent trouble. One was that of a young lady, who while chipping off the irregularities from the inside of a piece of pottery was struck with a minute piece of steel from the chisel. The foreign body, which was found lying upon the lens in the centre of the pupillary space, was removed with a Gruening's magnet. The ultimate result was normal vision.

In another case a spicule of copper about the thickness of a No. 5 sewing machine needle and three or four mm. long, had entered the anterior chamber and was found sticking in the lens substance near the edge of the pupil. The splinter was removed with a pair of smooth iris forceps through an incision at the corneal margin. A slight and sharply defined opacity of the lens remains, but fortunately it is not central, and the vision is as good as it was before the accident.

Dr. B. L. Millikin, Cleveland, Ohio:—The point in which I have been particularly interested is in regard to the after treatment, and the effect of atropia in paralyzing the accomodation in getting rid of the action of the ciliary muscle and what influence this has upon the after effects of these injuries. That is a point of a good deal of interest and it seems to me that in some of the cases where the amount of clearing up has been great, the atropia has been of great advantage by the complete rest which it has afforded. The point I wish to emphasize is the effect of absence of the accomodation in clearing up the lens matter after these injuries. Some of these cases have had extensive opacities and within a few days one half of the lens has become opaque. Within two or three weeks or less, the opacities have disappeared almost entirely so that the fundus could be made out. The question is whether or not if the mydriatic had been kept up for several weeks or months, it would not have effected a continuance of the clearing up of the lens, and it might not have remained clear.

EYE INJURIES CONSIDERED IN RELATION TO SYMPATHETIC AFFECTIONS.

Read before the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich, June, 1892.

BY T. E. MURRELL, M.D.,
OF LITTLE ROCK, ARK.

It is a difficult matter in many cases of recent injury to an eye to foretell the effect it will have on the fellow eye if it be not removed. There are numerous injuries that do not at first appear very serious, and there are good reasons for believing that not only may a good looking globe be preserved, but practical vision as well, which may finally prove very dangerous; while others that seem to doom the eye to sure destruction, as well as endanger the other eye, sometimes take a different course to our surprise.

We have had practical demonstrations of this in cases where our advice to remove the injured eye has met with refusal, and years afterward the person has been found still carrying it without the slightest trouble, much to his boasting and not much to our credit in his conception. Nevertheless, we know the slumbering dangers in these eye injuries that may awake after long years, and our boasting patient may yet come to grief. Injuries that threaten danger to

the fellow eye, may be divided into two general classes; those in which a foreign body lodges within the globe, and those in which the globe suffers violence from without.

Every one must at times be struck with the remarkable difference in tolerance of eyes to injuries, and it may be considered a fair rule to estimate the danger to the uninjured eye by the speediness and grade of the reaction in the injured eye. Yet we know that in these violent processes in which the entire uveal tract is speedily involved in suppuration there is less danger of sympathetic trouble than in the less severe and more insidious cases. The eye is peculiarly rebellious to the intrusion of a foreign body, and it is rare that such an occurrence does not only entirely destroy the eye thus entered, but finally leads to sympathetic involvement of the other eye. As is well known some portions of the eye are far more intolerant of the presence of foreign matter than others; this is peculiarly true of the ciliary body and the vitreous.

Just why the vitreous should be so ready to revolt at intrusion is hard to explain since it is not endowed with nerves or blood-vessels, but we know that the tiniest particle of matter lodged in it is almost certain, sooner or later, to be followed by severe reaction. Of course the injury done to other important parts, as iris, lens and ciliary body in its route to the vitreous, is to be considered, since reaction may first set up in them, but in many instances they escape and only the sclera and choroid are penetrated, which readily heal, and the reactionary process afterwards ensues in the vitreous. It is commonly believed at the present day that the reaction is the result of microbic infection introduced with the foreign body, or entering along its track from the conjunctival sac. If this be true, on what principle can we explain the want of reaction and final restoration of normal function with perhaps excellent vision when the foreign body, for instance a bit of steel, has been successfully removed with the electromagnet? Certainly all the germs are not brought away with the body; and the wound is greatly enlarged to introduce the magnet, thereby increasing the danger of invasion from without. Then again, observation shows that there is some property in the intruding body itself, perhaps of a chemical nature, that determines very largely the tolerance of the eye to its presence. In former years when percussion caps were used many accidents happened to eyes by fragments of the cap being driven into them on explosion. These injuries were singularly fatal, as my earlier experience verified by the necessity of the removal of many such eyes in gunners in the west. Now a piece of cap on the instant of explosion is at a very high temperature, sufficiently so to destroy any germs that might adhere to it, as I have seen severe burns from such a fragment when lodging in the conjunctiva or skin, and it enters the eye therefore aseptic. The same may be said of fragments of steel which oftentimes enter the eye at white heat and are soon followed by the most intense reaction and panophthalmitis. Is the danger to the fellow eye, then due to the transmission through lymph channels of pyogenous germs? This is a matter still in the hands of the pathologist. In the *Archives of Ophthalmology*, January number for this year, Dr. Poplawska reports the examination of twelve panophthalimtic eyes for microbes and found colonies in all, but they were bacilli and not micrococci, the orthodox pus producers. Furthermore they were found, if the foreign body was lodged in the vitreous, developed immediately around it, and were not found in its track through iris, lens, or ciliary body. Nor have they been found in the sympathetically affected eye. But whether or not microbes are the agents by and through which sympathetic ophthalmitis is engendered in some cases, there are many in which they are not and cannot be.

Take the cases of sympathetic inflammation following ten, twenty, and even thirty years after the lodgment of a foreign body in an eye, and how can we explain them on the microbic theory? Certainly these ephemeral germs could not lie so long dormant to be suddenly awakened into activity. The other class of injuries which endanger the fellow eye are those in which some anterior portion of the uveal tract is involved. Any injury by which the iris or ciliary body or both, becomes entangled in a cicatrix and is dragged upon always contains the element of danger to the other eye. How soon or how late, or if ever, this may occur is a matter of conjecture. A cut or rupture in the sclero-corneal junction leaving a cicatrix is a well known menace to the opposite eye, and yet I have seen very ugly and extensive injuries in this region which had not been followed by any sympathetic trouble many years afterward, and yet a small perforating ulcer near the margin of the cornea, into which the iris is dragged, I have known to eventually destroy the opposite eye through sympathetic inflammation. Any entanglement of iris or ciliary body causing traction and more or less constant irritation, is one of the greatest dangers to the integrity of the fellow eye. As has already been said, the most important question to both patient and surgeon in the early stage of a traumatism is as to the possible risk to the fellow eye. How often have we seen a rupture of the globe with prolapse of the vitreous or iris, under careful treatment heal without further trouble? And who will always condemn such an eye in the beginning, especially if no severe reaction is present or imminent?

A case in point will serve to illustrate the responsibilities that devolve upon the surgeon just here.

A colored man came to me just after an accident to his right eye. It had received a blow from a piece of wood causing a transverse rupture in the cornea extending partly into the sclera at the outer side. The iris was entangled in the wound and the pupil was obliterated. Under antisepsis and bandage the wound healed in a few days. At the end of two weeks the eye was clear, there was no tenderness or pain, and he had good light perception in all parts of the field. I decided to make an iridectomy for the purpose of restoring vision, and requested him to call again soon to have it done. Two weeks later he called complaining of pain in the left eye. To my surprise I found a mild plastic iritis. The right eye was now injected, tender to the touch, and had nearly lost light perception. I at once enucleated it, and found a cyclitis starting in the scleral end of the cicatrix. The other eye was carefully treated, and responded at first to atropine, and all looked favorable for a while, but a change for the worse took place after a couple of weeks, and in spite of all treatment it went into an iridocyclitis and the eye was lost. Here was a most rapid and unexpected process. I had in my mind from the first sight of the case the probable danger sometime in the future to the fellow eye, but as there had been no reaction until the wound had thoroughly healed I certainly did not look for so sudden an outbreak of sympathetic ophthalmitis in the other eye. In contrast with this I might mention the case of J. C., a girl aged 11 years, who has a very conspicuous puckered cicatrix extending entirely across the right cornea, and about 6 or

7 millimeters into the sclera on the outer side, the scleral scar being particularly ugly and depressed with entangled ciliary processes in it, and the iris being adherent to the corneal scar in its greater extent. The eye had light perception, and never gave any special annoyance. I found increased tension, however, more marked sometimes than others. Her left eye has had defective vision for several years, since shortly after the accident, viz.: V = 4-200, but she had never complained of pain in it, or photophobia or any other symptom except inability to see well. Ophthalmoscopic examination discovered no abnormality in the eye whatever. As the right eye was useless, and the nature of the injury a dangerous one, I advised its removal. Her father refused, and so I requested that he allow me to make an iridectomy. This he granted, and I accordingly removed a section of the iris. There was no more increased tension after this. I could now examine the anterior of the eye with the ophthalmoscope and found aphakia, cyclitic membranes and floating opacities in the vitreous. The injury was caused by a piece of broken bottle, which, being hurled with considerable force, accidentally struck her on the right eye when she was seven years old. I am of opinion that, unless removed, this eye will eventually cause the loss of the other. What could be the cause of the lowered vision in the uninjured eye?

In another case with an eye affected similarly to this through sympathy, I had the pleasure of seeing vision return after removing the offending eye. There are features in the case sufficiently interesting to warrant reporting it.

S. T., aged 18, who entered the Ark. School for the Blind in Sept. 1890, was subjected to an injury of his left eye when four years old by the penetration of a fragment of steel while standing near an anvil on which two men were hammering a bar of iron. The eye first inflamed and then became quiet, but was blind. He attended school, and had but little trouble until about two years afterwards. At this time the injured eye became quite painful at times, and the other eye grew very weak, so much so that for three years before I saw him he was unable to pursue his studies. When I saw him in September, his condition was as follows: O. D. V. = counts fingers 12 feet, slight photophobia. Ophthalmoscopic examination negative. He stated that his vision had been about the same for three years past. O. S. globe tender to touch, and injected. Diagnosis, chronic panophthalmitis. I at once removed the inflamed eye. Soon after all photophobia disappeared from his right eye, but vision was no better. At the end of a week vision had slightly improved. In a month V. = 16-128, in two months it was 16-32, in four months it was 16-25. The eye had now grown strong and could endure constant work, and he was sent home. I later heard from him saying he had no further trouble in using his eye. In the injured eye was found a small fragment of steel encysted in the vitreous humor near the papilla. The eye was completely disorganized. What was the nature of the sympathetic trouble in this case? The most careful examination failed to reveal any lesion in the fundus of the right, and yet vision was reduced to counting fingers at 12 feet. Another strange feature in the case is the slow but complete return of vision after so long continued reduction of same.

In illustration of the tolerance of the eye to injuries and foreign bodies, I would mention a case I have already reported to this Section where a fragment of glass measuring more than a half inch square lay quiet in the ciliary region of an eye for ten years without any irritation or sympathetic trouble whatever, and the eye was only removed on suspicion of danger to the other eye on account of the extensive cicatricial formations and entanglements of the uveal tract in the sclero-corneal region, without suspecting the presence of the foreign body in the eye. While writing this article, my eye chanced to fall on the title of a paper in the May number of the *Ophthalmic Review*, by E. Treacher Collins, reporting nine eyes removed a very long time after having been entered by a foreign body. The shortest time in which trouble arose after the accident was 14 years, and the longest 28 years, and in three cases, 24, 14, and 28 years, respectively, the eyes were removed on suspicion of the presence of a foreign body without there being any pain or other trouble.

Not one of these cases would have passed through the hands of a modern ophthalmic surgeon shortly after the accident without his urgent advice to remove the eye with the offending body. While this would be sound philosophy, and place the surgeon on the safe side, yet we must recognize the element of uncertainty in every recent eye injury.

Only a few days since, a farmer refused to permit me to remove a very dangerous eye for him on the ground that he had known many one-eyed persons all his life, lost by accident, and had never heard any complaint from them. While I expect my self-wise patient to turn up in sorrow some day, I cannot be positive that he will, and he may for years to come boast of his judgment against mine. With all the uncertainty in one direction there is a certainty in another that outweighs all, and that is: While an injured eye may not affect the other sympathetically, there is in many cases, well established by clinical experience, *very great danger that it will*, and in case the eye is already totally or practically blind, it is a certain safeguard against such an accident to get rid of it, and the surgeon fails of his duty, who would weigh the trifle of looks or sentiment against the all-important question of sight.

THE SURGICAL TREATMENT OF TRACHOMA.

Read in the Section of Ophthalmology at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY JOHN E. WEEKS, M.D.,

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In the present stage of our knowledge of the treatment of trachoma, surgical procedures accompanied by proper local medication, afford the most efficient and most expeditious means of effecting a radical cure. Surgical interference is not a thing of recent date. Scarification more or less extensive, has been resorted to, for many years.

In the beginning of the present century, after the return of the French troops under Napoleon, from Egypt, this disease assumed such importance and was so widely spread throughout Europe that the minds of all medical men were active in the attempt to devise means for its cure. At one time scarification was quite widely employed apparently for the purpose of local depletion in cases where the hypertrophy of the conjunctiva was marked. From 1812 to 1813 bleeding was extensively practiced in England and Germany for the cure of this as well as of almost all other diseases. The amount of blood taken, running as high as sixty ounces in some cases. Some surgeons bleed from the veins, others from the arteries, each claiming especial advantages for his method. Local bleeding by the means of leeches was advised, eighty to a hundred leeches being employed in some cases. Moxies and blisters were also employed.

In 1811 Rust (London) advised excision of the affected conjuctiva; this was done by Elbe (Stuttgart) in 1839. In 1854 Pilz (Prag) practiced excision of the individual follicles. In 1859 Barilla, an Italian, devised an instrument consisting of a brush made of fine metal wire, which he used for the purpose of brushing out the trachoma follicles. Samelsohn (*Arch. f. Aug. u. Ohrenheilk*, Vol. III, 1873) employed a fine thermo-cautery for the destruction of individual granules, effecting a cure by repeated sittings. Reaction was controlled by cold compresses.

Fieuzal, Fröhlick and Hirschman have also practiced this method. Reich (*Klin. Mtbl. f. Aug.*, 1888, p. 56) has used the galvano-cautery, employing a fine pointed electrode. The thermo-cautery was used by H. Korn (*Berl. Klin. Woch.*, 1870, p. 201) in 1870 in the following manner: a glowing platinum rod was passed over the conjunctival surface much as the crystal of the sulphate of copper would be employed. The globe itself being protected by a Jaeger's plate. A superficial eschar was the result. A partial or complete cure was obtained after three or four sittings. The scars resulting were sometimes very annoying.

The systematic excision of the retro-tarsal fold was first practiced by Galezowski in 1874 since which time it has been employed with more or less modification, by many operators. Galezowski considers the operation to be applicable in all cases where trachoma granules are present in the retro-tarsal folds. His method is as follows: Ether is used in some but not all cases. The lid is everted and one blade of Galezowski's double pointed tooth-forceps is passed to the bottom of the cul-de-sac. The teeth of this blade are engaged in a fold of conjunctiva which is drawn downward and the forceps are closed over it. This gives the operator control of the fornix folds. With a pair of scissors the piece to be excised is marked out and carefully dissected from the underlying tissue. A piece of conjunctiva three to eight mm. wide and as long as the fornix folds is removed. No sutures are employed. The eye is washed with a mild antiseptic solution. A bandage applied and the patient sent into the ward.

Heisrath, Jacobson, Vossius and others excise a portion of the upper part of the tarsus, if the tarsal conjunctiva is involved, along with the fornix folds. Sattler uses sutures to close the wound in some cases. If the plica semilunaris is the seat of granulations, Sattler does not hesitate to excise it. Dr. Sueller (*Arch. f. Oph.*, V. XXXIV, p. 131) devised a clamp forceps which is a modification of Desmarre's forceps, with both blades fenestrated, which he employed for the purpose of engaging the fold of conjunctiva to be excised; after being caught in the forceps the fold was cut off by means of the scissors. He washes the conjunctival surface with sublimate 1-3000 after the operation and dusts iodoform on the denuded surface. A bandage is then applied. This dressing is renewed every day until the wound has healed; about eight days after the operation of excision of the fold, the operators agree in saying that in the majority of cases the remaining granulations gradually grow smaller and disappear. Relapses are infrequent.

Sattler (*Zeitschrift f. Heilk.*, Berl.,1891, p. 45) practices scooping out the contents of the follicles, employing for that purpose a sharp oval curette 2x4 mm. in size. The apex of the granule is scarified and the contents then removed with the curette. This is done in all parts of the conjunctiva, the loose folds being made taut by the use of some such instrument as the forceps of Heinheiser. This instrument (which is double pointed) is so constructed that the distance between the points can be increased after the conjunctiva has been seized. After the operation the conjunctival surface is washed with a solution of sublimate $\frac{1}{1000}$; this is repeated every day until recovery takes place. Swelling is reduced by the application of cold compresses. A number of sittings are necessary to effect a cure.

Electricity in the form of electrolysis has been advocated by G. Lindsay Johnson, of London (*Arch. of Oph.*, Vol. XIX, p. 264), to be used after the following manner: The patient is anæsthetized. The lid is everted over a horn spatula and held in position by a vulcanized double hook. The conjunctiva is then scarified with a three bladed "silonneur" adjusted to cut to the desired depth. The incisions are made parallel to each other and to the margin of the lid, over tarsal and fornix conjunctiva. After the bleeding has abated the grooves are traversed by a double bladed electrode which is connected with six Stoher's carbon and zinc cells. A yellowish, frothy mass exudes as a result of the electrolytic action. After cleansing, the conjunctival surface is dusted with calomel and is subsequently smeared with an ointment of hydronaphthol in vaseline $\frac{1}{100}$; the results are said to be very good.

Since Barelli (1859) devised his metal brush for removing the granules from the conjunctiva other appliances for the same purpose have been brought forward. Fodda (1870) caused an instrument to be constructed consisting of a metal plate set with numerous very fine teeth, arranged in rows, which he termed a "spinatore." Manelescu, of Bucharest, used a stiff, bristle tooth brush cut to ¼ in. in length for this purpose. Keyser, of Philadelphia, also employs it. (*Oph. Rec.*, 1891, p. 51.) This method is employed by Arnant (*Annal d'Oculistique*, Jan. and Feb., 1889) for the purpose of introducing a solution of sublimate, 1 to 120 or 1 to 100, into the trachomatous tissue merely and not for brushing out the the granules.

Expression as a surgical procedure in the treatment of trachoma is now widely practiced. I have been informed by an eye witness that Galezowski employed this procedure, in his clinic in 1874, and that he had a special forceps constructed for the purpose. Wolfe (*Diseases and Injuries of the Eye*, London, 1882, p. 51) advises scarifying with Desmare's scarificator and subsequently squeezing out the contents of the follicles with the thumb and fingers. One or two days later he applies a solution of tannin to be used by rubbing it on the conjunctival surface. At the meeting of the Illinois State Medical Society, 1889, Dr. Prince presented a ring forceps which he had devised in the treatment of trachoma. They were used as an adjuvant to other non-surgical methods. Dr. H. D. Noyes introduced a forceps of his own design shortly after those of Prince appeared and he has been followed by Knapp, Gruening and others. The mode of operating with Noyes' forceps is as follows: The patient is etherized, the lid everted and the loose folds of the conjunctiva caught up with the forceps; two pairs are used. A gentle stripping movement is persisted in, the folds being caught by one pair of forceps as the other pair passes off, until all of the trachoma granules have disappeared. The contents of the granules are pressed out and appear on the forceps as pulpy, reddish manes. Noyes' forceps are so constructed that the conjunctiva at the canthi and the semilunar fold can be rapidly reached, which is not the case with the roller or fenestrated forceps. The granules on the tarsal conjunctiva are reached by placing one blade on the tarsal conjunctiva and one in the retro-tarsal fold. The fenestrated forceps are used much in the same manner. Knapp's roller forceps are used, particularly in the treatment of

trachoma follicles situated on the tarsus, by placing one blade on the conjunctival and one on the cutaneous surface. By compression the trachoma granules are crushed into the tissue of the tarsus, their contents not being removed. The after treatment as carried out by Noyes and Knapp is mildly antiseptic and astringent.

A method for the surgical treatment of trachoma has recently been developed by Darier, in Abadie's clinic in Paris (*Rec. d'Ophthal.*, Paris, 1890, p. 708) which consists in a combination of a number of methods previously in use. The affected conjunctiva is scarified and subsequently a strong solution of sublimate 1 to 500 is brushed into the tissue by means of a tooth brush. The method is termed "grattage." It has been used extensively in the clinics of Paris and to some extent in New York, with very good results. The surgical procedures employed for the treatment of trachoma have been briefly mentioned. We may now consider their relative value, but before doing so it would be well to consider the indication for treatment.

The outset of trachoma is usuall accompanied by redness of the conjunctiva, some hypertrophy of the membrane and considerable discharge. In certain cases the condition can with difficulty be differentiated from the ordinary conjunctival catarrh. The conjunctiva may assume a thickened velvety appearance, the granulations first becoming visible on subsidence of the swelling and intense hyperæmia. Usally more than one member of the family is affected with this form of trachoma and usually when it occurs in asylums or residental schools many of the inmates are apt to contract the disease. There is a class of cases occurring usually in children of from 5 to 14 years of age, in which on eversion of the lids a mass of pale spawn like granulations is thrown into view, embedded in the slightly hypertrophied conjunctiva. In these cases the annoyance experienced by the patient is slight. There is little secretion. This form of trachoma appears sporadically. It possesses but little of the contagious nature so pronounced in the form where the secretion is copious. The contagiousness of trachoma is probably in direct proportion to the amount of the secretion.

In this early stage, which might be termed the first stage of trachoma, the follicles are discrete. They consist of aggregations of lymph corpuscles, situated immediately beneath the epithelium, having a more or less marked fibro-vascular capsule and traversed by very fine trabuculæ of connective tissue fibers. As the disease progresses the follicles or granules coalesce. This occurs particularly in the upper third of the tarsal conjunctiva, but is not confined to this region.

The conjunctival surface becomes reduced in area, cicatricial patches and bands appear. From friction on the cornea superficial keratitis, deep ulcers and pannus result. This may be termed the second stage. The third stage is essentially one of atrophy, and shows rather the result of trachoma than trachoma itself. The surgical procedures necessary for the correction of the results of trachoma as found in the third stage, will not be considered in this paper, and consequently need no further mention.

The contagious nature of trachoma considered in connection with the facts elicited by Michel, Sattler and others in their bacteriological researches, furnishes very strong evidence of the microphytic origin of the disease. If we accept the above statement as facts, concerning the structure of trachomatous tissue and admit it to be of germ origin, we may easily formulate the general indications for treatment.

1. The obnoxious tissue should be removed if such a thing be possible, without producing too much deformity of the lid.

2. The destruction of the germs instrumental in the production of the disease, should any remain.

3. The after treatment should be so conducted that a smooth surface should result. Procedures that are purely mechanical may fulfill the first indication, but mechanical must be aided by therapeutical measures to fulfill the second and third general indications. It may be claimed that the plasma of the blood is sufficiently germicidal to destroy what trachoma germs may remain after mechanical means have been employed to remove trachomatous tissue. This may have a grain of truth in it, but the fact remains, that after purely mechanical means have been employed, recurrences of trachoma in the operated eyes is not uncommon. It is a fact recognized by all observant surgeons, and demonstrated by laboratory experimentations that bruised or crushed tissue forms a most favorable nidus for the development of microörganisms, therefore it is not only logical, but actually necessary that a germicide be employed after the surgical procedure to render the conditions for recovery most favorable. Recurrences should not occur, since their prevention is fully within our power.

In the first stage of trachoma the method by expression is by far the best to pursue. Since it does not imply loss of conjunctiva it is far better than excision. It is efficient and speedy, therefore better than the destruction of individual follicles by the cautery, removal with the curette, etc. Theoretically, and I believe it must prove so experimentally, it is better to remove the contents of the follicles than to crush them into the tissue. Because of this, I prefer to use Noye's forceps, regarding it as the best forceps made. In the employment of expression, I have found that the removal of the contents of the follicles is facilitated by a superficial scarification of the apices of the elevations, the incisions running parallel to the margin of the lids; I consequently scarify in these cases. After the expression, I am in the habit of introducing a germicide into the bruised tissue, using an ordinary toothbrush for this purpose loaded with a solution of sublimate 1-500 or 1-1000. After the treatment as above described, the patient may be treated as an out patient, but it is better to keep him in the wards of the hospital for a few days. In the latter case a compress bandage should be applied; after twenty-four hours the conjunctival sacs should be washed with a weak sublimate solution. If there is a tendency to puffiness of the lids, the bandage should be reapplied.

Swelling due to traumatism is much more easily controlled by a pressure bandage, and is more comfortable to the patient than are cold applications or medicinal applications of any sort. The tendency to swelling of the lids will have disappeared in thirty-six to forty-eight hours, when the bandage may be removed; but little reaction follows the operation.

To prevent the formation of adhesions between folds of the conjunctiva, it is well to sweep a probe through the conjunctival sacs at intervals of twenty-

four hours for a few days after the operation. Mild antiseptic washes and the occasional application of a 1 per cent. solution of the nitrate of silver as recovery advances, will suffice to effect a complete cure without deformity.

This form of treatment which meets all the indications, has proven in my hands to be most satisfactory in the first stage of trachoma; in the second stage of trachoma it may be considerably improved upon. Sclerosed masses of trachomatous tissue will not be squeezed out, consequently if we would cure these patients we must employ other methods. The sclerosed tissue has been cut away by Sattler, and attempts have been made to brush it away by Manolescu. The form of treatment that in my hands has given greatest satisfaction in this class of cases, is that advised by Danier and Abadie. The method is known as "grattage." I have employed it now in quite a large number of cases, and have yet to see a patient on whom I have operated who has not been benefited. The greater number of cases have been virtually cured.

For the performance of the operation I have devised a scarificator and a forceps. The scarificator consists of a handle into which three movable blades are set. The blades are about one inch in length and are placed parallel to each other and about 1-16 of an inch apart. They may be removed for cleaning, at will. A guard to regulate the depths of the incision is supplied with the instrument. The forceps consist of a scissors handle with a catch. The blades are $\frac{2}{16}$ and $\frac{3}{16}$ of an inch wide, respectively. The opposing surfaces are ground in their long axes. The blades are of equal thickness from point to shank, and are $\frac{7}{8}$ of an inch in length. In use the narrow blade is placed on the conjunctival surface, the broad blade on the integument parallel to and at the margin of the lid. Eversion is performed by rolling the lid over the forceps.

The operation is briefly as follows: The patient is anæsthetized. If the palpebral fissure is shortened by cicatricial contraction a free canthotomy is made, the margin of the lid is now seized by the forceps and the lid is forcibly everted. This exposes and puts on the stretch the whole conjunctival surface. The trachomatous tissue is then scarified to about $\frac{2}{3}$ of its depth, the incisions running parallel to the margin of the lid. The surface is then rubbed over with the back of a scalpel or the conjunctiva is manipulated with the trachoma forceps for the removal of the movable trachomatous tissue; after this the conjunctiva is brushed, quite vigorously, with an ordinary tooth brush which carries a solution of the bi-chloride by means of mercury $\frac{1}{5\,0\,0}$. After thoroughly introducing the bi-chloride by means of the brush the canthotomy is converted into a canthoplasty; if permanent enlargement of the palpebral fissure is desired the surface of the conjunctiva is cleansed and a compress bandage applied. The previous remarks regarding traumatic ordena apply here. Severe as the operations may appear the reaction is usually very slight. The after treatment is very important. It consists in preventing adhesions between folds of conjunctiva by occasionally sweeping a probe through the conjunctival sacs and by the application of antiseptic and astringent solutions as required. It is customary to apply a solution of sublimate $\frac{1}{5\,0\,0}$ to the conjunctival surface every twenty-four hours for from three to eight days after the operation. Bathing with a solution of boric acid 3 per cent. two or three times daily and the application of astringents as required. The treatment may produce the result desired in three weeks—it may require three months, however. A satisfactory result is the reward in almost every case which cannot be hoped for in other cases by other methods of treatment. Nellie Lynes, N. Y., aged 28 years, came to my office on March 19, 1892. She had suffered from trachoma of the conjunctiva of the left eye for three years. The patient has been under the care of Dr. D. B. St. John Roosa for about two years having been an inmate of the Manhattan Eye & Ear Hospital for three weeks. About two months before seeing me she had been operated upon by the roller forceps by Dr. Herman Knapp. When first seen the conjunctiva was rough, there were distinct trachoma follicles in the tarsal conjunctiva and a few in the retro-tarsal folds. There was superficial keratitis and vascular pannus with narrowing of the palpebral fissure, intense photophobia and profuse lachrymation. I advised the treatment described above. The patient was admitted to the New York Eye & Ear Infirmary on my service and the operation was performed on March 22. At the end of two weeks the patient was discharged with the lids much improved; there was still some roughness.

The pannus and superficial keratitis were much improved. She has since been treated as an out patient at my office, coming twice or three times a week. When seen last, June 2d, the lids were smooth, the cornea free from ulceration, no photophobia. Patient experiences no discomfort. She has resumed her position and is virtually cured.

The presence of corneal ulcers or pannus was marked; using the galvano-cautery for the purpose the pannus was favorably affected by this procedure but was not entirely done away with.

I wish to emphasize the necessity of careful and persistent after treatment; without it failures will result and the operation will not meet with the favor that it deserves.

Experience has led me to the following conclusions, viz: *a.* In the first stage of trachoma the most efficient mode of surgical interference is that of expression combined with superficial scarification and the introduction of a germicide by the use of a brush. *b.* In the second stage, where surgical interference is advisable the treatment known as "grattage" combined with expression in some cases. Canthotomy or cantholplasty if necessary, gives the most satisfactory results. *c.* The operations as above advised convert a contagious into a non-contagious condition and the patient may be admitted to wards for ordinary surgical cases, without fear of infection.[1]

Discussion.

Dr. L. H. Taylor, Wilkesbarre:—During the past two years I have had considerable experience with the operation of expression. I happened to be in New York three years ago, and saw a patient operated on by Dr. Noyes. Immediately afterwards I secured a pair of his forceps, and soon afterward I operated on a patient whom I had been treating for more than six months with very little benefit. I recently had occasion to see this patient again. The operation was done two years ago, when the patient was 16 years of age. She has since remained entirely well. Since that time I have operated on quite a number of patients, to a limited extent with cocaine, but this is very painful, and I think

[1] For some of the data relating to the history of the surgical treatment of trachoma, I am indebted to Sattler, Zeitschrift f. Heil., Berl., '91, p. 45. For record of cases and further discussion see Weeks, N. Y. Medical Journal, October 24, 1891.

that the patient should be etherized. I think, in regard to what has been said, that it is possibly not so much the method as the thoroughness with which it is done, and the kind of a case upon which we operate. Many of the cases of hard, dry trachoma are, in my judgment, not suited for the operation. It is rather cases of the follicular type in which the soft matter can be expressed. I have seen considerable reaction in some cases, but nothing serious. The after-treatment has been kept up for some time. This has consisted in the use of astringent and antiseptic applications.

Dr. H. V. Würdemann, Milwaukee:—In the State of Wisconsin we have a large foreign element, and hence our surgeons seem to see an undue proportion of cases of trachoma. Hardly a week passes in my private practice without an operation for trachoma, usually by expression or by the method of Sattler, and occasionally by the use of the fine galvano-cautery point. After that I use sublimate and other medicinal treatment, massage by boric acid, etc. After this, if necessary, I use blue stone. I do not consider the case fully cured until it has been under observation for six months; that is, in follicular trachoma. In lymphatic trachoma we frequently are obliged to operate several times, and I don't consider it advisable to promise but one operation, or permanent cure without months of subsequent treatment. After surgical treatment we do not see so much scar formation as after cases treated entirely by blue stone.

Dr. F. C. Hotz, Chicago:—It is pleasing for one who has advocated for many years the mechanical treatment of trachoma, to see that the method has gained many friends. Six years ago, I recommended in the *Archives of Ophthalmology* the method of expelling the trachoma follicles by pressure, and at that time, as far as I could learn by researches, this mechanical treatment had been practiced by very few oculists.

The method to be employed is a matter for individual choice. It makes little difference what method is adopted, provided it is done gently and thoroughly. I believe in the principle always to use the simplest means for accomplishing your purpose. I therefore do not employ specially constructed instruments if I can achieve the same thing as well with my fingers, and the evacuation of trachoma bodies in the upper lid can thoroughly and quickly be accomplished by pressure with the fingers properly applied. I turn the lid and hold it everted with the forefinger of one hand, and run the thumb or the forefinger of the other hand up under the lid to the end of the retrotarsal fold. The lid is thus placed between two fingers, and when these now are gently pressing toward each other, and at the same time are gliding down toward the lower edge of the everted lid, any follicles caught between this finger-press are thoroughly squeezed out.

That is the simplest method, and can be done at apy time, because you always have your instruments with you. Of course it is difficult in this way to reach follicles near the angles of the lids. To reach these recesses, forceps of one kind or another are very convenient. I am not particular what kind you employ. I have adopted a pair of forceps after the pattern of the old-fashioned long curved iris forceps, and they answer the purpose better than any ring or roller forceps. In the lower lid, where we often have a long fold of infiltration, we can remove the contents readily with the forceps. Thoroughness and gentleness are most important, and it is surprising how little reaction is seen after the procedure. That one application, no matter by which method, will be sufficient, no one will claim; and treatment of the lid for some time is always necessary to insure permanent results. Of all the operative treatment, the squeezing method is, in my opinion, the best and the gentlest. Scrubbing the eye with a tooth brush, I think is too barbarous and brutal a procedure to be admitted. The excision of a portion of the conjunctiva is a very quick way of getting rid of the diseased conjunctiva, but the treatment is worse than the disease. It resembles the attempt to relieve a person permanently of a corn by amputating the toe; for if you remove the conjunctiva there is no soil left for the trachoma to grow in.

The mechanical treatment avoids the shrinkage of the conjunctiva and the destruction of the membrane by atrophy, and it saves to its full extent the retrotarsal fold, which in the movements of the eyeball plays an important *rôle*. When shrinkage takes place, the eye is embarrassed in its movements, and mechanical irritation is set up by the shortness of the fold, which does not allow the eyeball sufficient freedom of motion.

Dr. H. Knapp, New York:—I have treated a good many cases in this way, and have used different instruments. I have used the instrument of Dr. Prince, and also that of Dr. Noyes. I could succeed with either, but not without a good deal of laceration of the conjunctiva. I therefore devised the roller forceps, and since then, the more I have used it the better satisfied I have been with it. Dr. Weeks says that the follicles are crushed and not expressed. All the material which is held between the rollers comes out in globules or as a viscid fluid. That is just what insures success. The granules in the inferior as well as those in the superior retrotarsal fold are readily pressed out. Be the lids never so studded, the follicles can mostly be removed cleanly and the case cured in one sitting. I can prove this by dozens of cases. The operation requires ten minutes or more. All the granules come out, and there is nothing left but completely clean mucous membrane, over which the roller passes without resistance. When this condition in follicular trachoma is reached, we may be sure that nine cases out of ten are cured, and we need use no antiseptic. This method causes less traumatism, and can be done with greater thoroughness, than any other that I have seen. There is no method that is free from relapses. If these relapses come under treatment early, a few touchings with blue stone mostly afford prompt relief. A permanent cure is more likely to be secured when the squeezing is followed by four, five or six weeks of sulphate of copper treatment. A perfectly healthy mucous membrane, with very little cicatrization, is obtained. That all cases are cured without relapse, I do not pretend. Five or six cases out of 250 have come back to me with relapse, and I had to repeat the squeezing. These were very bad cases, but all cured by the second operation.

Concerning antiseptics, I am not sure that our bacteriological researches in regard to trachoma are perfect. They are not sufficient to demonstrate that trachoma in all cases is a bacterial or contagious disease. There are a number of cases where there is not a particle of irritation, and where the patient is not aware of the trouble until we turn the lids and find the retrotarsal folds studded with granules. There has never been any pain, heat, or discharge. The granules are like lymph follicles. It is not considered as demonstrated that any particular or specific microbe is the cause of trachoma.

On the other hand, we are well aware that trachoma is the consequence, or follows in the wake of inflammatory diseases of the conjunctiva. The contagiousness of such cases is unquestioned.

As regards the therapeutic effect of the mechanical treatment, and especially the method of squeezing out the trachomatous material, I can say that it has proved a great blessing in my practice. It shortens the treatment very much, and in a number of cases it effects a cure in one sitting without other treatment. Next to cataract, I think that trachoma is the most important of the diseases of the eye. In regard to diffuse and cicatricial trachoma, my results have not been satisfactory.

Dr. J. E. Weeks, New York:—In regard to the action of the roller forceps, the construction of the roller and its application to the surface of the conjunctiva, certainly implies that the tissues between the rollers must be crushed, and where there is sufficient tissue left between the rollers to permit of the retention of the subconjunctival tissue, a greater amount of trachomatous material must remain than where simple squeezing is employed. I have seen more recurrences after the use of the roller forceps than after the use of the forceps devised by Dr Noyes, and I think that the mechanical principles involved in the construction of the two instruments are certainly in favor of the forceps of Dr. Noyes.

In regard to the use of antiseptics, while I have not maintained that trachoma has been *proven* to be due to germs, I have suggested that the researches that have been made, and the history of the disease, are such that we may consider it more logically to be of microphytic origin than due to any other cause. We have here an affection which, in the majority of cases, has seemed to me to be contagious. We find that where trachoma occurs in one member of a family, it usually affects a number. Where it occurs in residential schools a number of scholars, as a rule, are attacked. If this does not point to contagion I do not know what does.

Dr. Knapp:—How about trachoma confined to one eye?

Dr. Weeks:—We have gonorrhœal conjunctivitis, a disease known to be of microphytic origin and also contagious, confined to one eye—this is also, not infrequently, the case in epidemic catarrhal conjunctivitis. Trachoma confined to one eye is exceptional, and does not afford the slightest evi-

dence against its contagious nature. If the disease is contagious, it is logical to use an antiseptic (I have been informed that Dr. Knapp himself uses an antiseptic in the treatment of trachoma). It seems to me that in this way we may prevent recurrences that otherwise would take place.

I have seen a good deal of the treatment with blue stone, and can remember only a few cases where a cure was effected. Relapses are the rule, and the treatment of the relapse by a few applications of blue stone does not suffice to cure it. It is exceptional to find a radical cure follow the use of blue stone. Experiments with a pure culture of the staphylococcus aureus made by myself in Knapp's laboratory, demonstrated that blue stone is not a germicide. It is therefore a simple irritant, and increases the vascularity of the conjunctiva. Even if it can be shown that "dozens of cases" are cured by expression alone without an antiseptic or after-treatment, that is no proof, and is no argument against the use of a germicide. If only a few relapses occur, a germicide should be employed to endeavor to prevent all recurrences.

CLINICAL HISTORY OF A CASE OF SUCCESSFUL EXTRACTION OF A PIECE OF STEEL FROM AN IRIS AND LENS BY AN IRIDECTOMY, WITH SUBSEQUENT ABSORPTION OF THE LENS AND RECOVERY OF NORMAL VISION.

Read in the Section of Ophthalmology, at the Forty-third Annual Meeting of the American Medical Association, held at Detroit, Mich., June, 1892.

BY CHARLES A. OLIVER, M.D.,

ATTENDING SURGEON TO WILLS' EYE HOSPITAL; OPHTHALMIC SURGEON TO THE PRESBYTERIAN HOSPITAL, ETC., PHILADELPHIA.

On the second day of March, 1891, H. M., æt. 29 years, a blacksmith, came to Wills' Eye Hospital, complaining that his right eye had become inflamed from the supposed lodgment of some foreign substance in the cornea one day previously. Attempts at extraction had made the eye very painful, which was relieved by the use of a weak infusion of tea leaves. Two years previously, the same eye had been struck by a piece of steel measuring roughly about 4 millimetres square, the foreign body not penetrating the eye, though leaving the organ irritated for several days' time. Vision was in no way subsequently disturbed, and the organ had never become troublesome up to the time of the second accident.

At the time of the first examination, a small mass of foreign substance was found imbedded in the upper inner quadrant of the cornea, about 3 millimetres above the horizontal meridian, and in an almost identical position in the underlying iris, there was a round black bead about the size of the head of a small pin, from the upper part of which could be seen, by strong oblique illumination, a line of metallic-like lustre. A faint deposit of precipitates on the membrane of Descemet, with slight pericorneal injection, existed, though there was no evidence of any ciliary tenderness. Vision with this eye had fallen to slightly less than one-eighth (5-40?), and the accommodative range was limited to the reading of type 0.75 D. from 13 to 30 centimetres. Through the undilated pupil, the eyeground could be fairly seen, it appearing healthy. No abnormality could be seen in the left eye, its vision being one and one-half (5-7½), and the accommodative range extending from 13 to 36 centimetres for 0.50 D. type.

The foreign substance was removed from the cornea, and upon consultation with Dr. Wm. F. Norris, an immediate iridectomy, including the piece of supposed metal, was advised; the latter procedure, however, the patient refused to accept. Upon this decision, a soothing collyrium of boric acid and a Liebreich bandage were ordered, with a request that he should report in the morning.

Upon the following day the patient returned to the hospital, stating to the resident surgeon, Dr. Zimmerman, that an exacerbation of pain in the eye during the night, had decided his willingness to return for operation. He was immediately put to bed, bowels were purged, eyes bathed freely, and he was kept quiet until the next clinic day (March 4), when upon reëxamination, the anterior chamber was found somewhat shallow, and the lens was slightly swollen and becoming opaque in the position of the situation of the foreign body. At this time, the iris tissue in the vicinity of the traumatism was noted as muddy in appearance, with the formation of a synechia at the upper pupillary edge, the ciliary region being slightly tender to the touch. In spite of these inflammatory conditions, a narrow incision with an angular keratome was made at a position in the cornea just inside of the limbus, corresponding with that of the foreign body, and an iris forceps passed in and the object (a flat piece of steel of about 1 millimetre in diameter), with the surrounding bruised and inflamed iris tissue, grasped, brought out and excised—making a clean iridectomy. The lens area exposed to view showed the point of the original wounding of the capsule, with the situation of the greatest amount of swelling and opacity. Atropine and a light pressure bandage were applied, and the internal administration of small tri-daily doses of calomel, with rest in bed, was enjoined. In two days' time, the wound in the cornea had healed, the inflammatory symptoms had greatly subsided, and the lens matter had begun to rapidly absorb, until on the 18th of the month, there was but one plug of lens material to be seen, this being situated in the lower portion of the anterior chamber. Eleven days later, the remaining lens mass had disappeared, the eye was quiet, and vision could be brought to almost normal by the use of a + S. 11 D. lens.

At the present time, about fifteen months after the accident, there is a perfectly quiet eye, with a narrow coloboma up and in; an eye which, in spite of a few fine linear folds of capsule at the lower inner border of the pupil, which can be barely recognized during moderate pupillary dilatation, and a faint concentric ring of lens and capsular débris, which can only be seen at the periphery of the coloboma, possesses normal acuity of both central and excentric vision, the patient possessing an acuity of 5-5 with + S. 11. D. ⊃ + C. 0.50 D. ax. 100°, and reading many words of type 0.25. D. fluently at 8 inches distance with an additional convex lens of 4 diopters strength.

The case is interesting upon account of the immediate curative effects of an iridectomy which removed an offending substance and its bed of bruised and inflamed iris tissue, thus allowing a free, rapid swelling and disintegration of lens matter to uninterruptedly take place during a watchful and careful after-treatment; this immediate happy result being supplemented by a subsequent restoration of vision to full acuity, with but little necessary correction of astigmatism, in a comfortable and unirritated organ.

THE BICYCLE IN MEDICINE.—Dr. W. H. Burr, of Wilmington, in *Merck's Bulletin*, observes concerning the treatment of tuberculosis that it is irrational to fill the patient with drugs, if no attempt is made to change the environment in which the disease was contracted. His system should be "flooded with oxygen" as a prime requisite to a reformed metabolism—while at the same time the excretory organs are not overlooked. "The bicycle," says Dr. Brown, "in my opinion is one of the most advantageous means of administering oxygen. The bicycle will digest more fat meat and starchy vegetables than any other means of exercise known." The late Dr. Frank H. Hamilton was fond of saying that "the best thing for the insides of a man is the outside of a horse," but he was of that generation, now nearly passed away, that was unacquainted with the wheel in its newer forms and those that are best adapted to the open air occupation of invalids. Thousands of persons can have bicycles to whom the living steed is out of the question. And the proprietorship of a horse is not an unalloyed privilege, since too much exercise may at times be unavoidable through considerations affecting the servant-animal, but the bicycle can be stopped and made to rest at the will of its owner. Dr. Burr concludes his observations by saying: "The latest theory in the treatment of tuberculosis is rest. I prefer to say: Action with rest—as the unpleasant necessary concomitant—but which should be gradually, steadily and progressively abridged." Mr. Gladstone is an ardent admirer of this most rational means of physical betterment. He is reported to have said recently, in an interview: "I can only emphasize the fact that I consider that physically, morally and socially, the benefits that cycling confers on the men of the present day are almost unbounded."

COLORED MORPHINE.—It has been proposed by a German physician that morphine be always stained a bright red with aniline, in order to diminish as far as possible mistakes in compounding.

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SATURDAY, SEPTEMBER 3, 1892.

THE TURKISH BATH.

DAVID URQUHART, an enthusiastic Englishman, was the foremost promoter of the hot air bath, named by him the Turkish bath, which is daily challenging the attention of the medical man. Its increasing popularity among the laity calls for thoughtful action by the profession. If it is to be permanently identified with the life of our people there will necessarily be much in it of great practical interest to the scientific physician. Hot air as a therapeutic measure is older than the time of HIPPOCRATES, who identified himself with its use. During the prosperous times of the Roman Empire it became one of the most popular institutions of the day. The many ruins now standing throughout what were but provinces of Rome, attest its extensive employment at that time.

No new theory is propounded, on the contrary, this is what has been known, though imperfectly practiced, for centuries. Air and water and temperature are the most salutary and unfailing agents for the correction or alleviation of the numerous derangements to which life is exposed.

In the hands of its modern advocates the Turkish bath has met with varying fortunes, according to the skill or merit of its promoters, and it is most desirable that the scientific mind should rescue it from whatever pertains to charlatanry. Its use as a therapeutic measure naturally comes within the province of the medical profession, and if there follows even a fraction of the benefit claimed by its enthusiastic advocates, the community will have occasion to be thankful.

Its action in rheumatism and some of the neuroses, as well as blood poisoning, has been marked by many successes. But the larger field for this bath will probably come in the line of preventive medicine. It does prove of service as a means of rest to those who are suffering from the every day pressure of overwork. There is little doubt that our people will gradually become educated to the legitimate use of this bath, and that it will ultimately be largely adopted by them as a habit. It will supply a much needed want, by increasing our sanitary resources, helping to lift all to a higher plane of health, and the physician to a higher standard of work. A most desirable and convincing method of promptly testing this would be by placing a well equipped Turkish bath, in charge of one conversant with it, in some of our asylums and hospitals. It is a lamentable fact that bathing facilities in these institutions are as a rule of the rudest and most undesirable kind.

It is well to guard against any immature conclusions. At the same time, those who have experienced the feeling of vigor and elasticity arising from the use of this bath will be inclined to pardon the enthusiasm of its votaries. Opportunity, tests, and time will surely reveal all its lasting virtues, and it is always wise to range ourselves on the side of cleanliness and purity. It was DR. ANDREW COMBE who said, "We ought to extend the hand of welcome to every man who is able to correct an established error, or add a new truth to the existing store; and much more so, if the offered contribution should be of that new and important principle capable, if true, of modifying and improving the whole field of medical practice."

There is a moral obligation resting on all who have intelligence and opportunity, to become acquainted with the laws of health, and live in obedience to them, and also to gain a knowledge of the simple and natural agencies by which deviations from the normal standard can be corrected. When once this knowledge becomes general, there will be a vastly smaller field for any form of quackery, and the too general use of patent medicines will be dispensed with. None are better qualified than medical men to lead in such a reform.

NON-NARCOTIC TREATMENT OF DELIRIUM TREMENS.

DR. NORMAN KERR made some remarks at the Nottingham meeting of the British Medical Association, in favor of the use of the liquor ammoniæ acetatis, to the exclusion of all narcotics, in delirium tremens. He stated that he now relied, even in the graver forms of the trouble, on drachm doses of that remedy, given every hour. Milk, beef juice, broth and coffee are frequently administered. In the case of a publican, in his third seizure, rendered especially serious by an intercurrent eplosion of epilepsy, this treatment resulted in sleep at the end of seventy hours. This sleep lasted four hours, after which there was a period of wakefulness for four hours more, and then a long sleep of twenty hours. The subsequent recovery was more rapid than from his second attack,

which had been treated with opium and bromides: in that seizure even after a forced narcotic sleep the man was so violent that four men were needed to control him, and in order to save his life he was put in the padded room of the nearest workhouse.

These two attack, says DR. KERR, as quoted in the *Medical Press and Circular* for August 10, were typical examples of the graver form of delirium from alcoholic saturation. The compared results of the two different plans of treatment bespeak a reliance on a safe sudorific like the liquor ammoniæ acetatis and suitable nourishment, as best fulfilling the conditions of cure; the main point being, in his opinion, the avoidance of all alcoholic stimulants and all narcotics. "The best hope of cure lay in natural exhaustion inducing sound refreshing sleep." While this state persists the *vis medicatrix naturæ* is given a fair field to accelerate the elimination of the accumulated alcohol.

"THE BRABAZON WORK."

By this name is understood to be indicated those plans of employing the insane and other non-valid dependents of the State. The *Charities' Record* contains some of the newest facts regarding this means of adding to the welfare of the inmates of poor-houses—not the able-bodied, but the infirm. Some time ago we published in these columns an account of the "Brabazon Employment Scheme" in vogue in some of the English workhouses, and later a letter from a lady in Philadelphia telling of what is being done at the Blockley Asylum for the employment of the insane. A committee of the Central Association has been formed to take up this work in the State and already something has been done. The inmates of the epileptic pavilion on Blackwell's Island, New York City, have been instructed in needle-work of various kinds and under this instruction have made a number of articles from materials furnished them, whereas heretofore their time has been almost entirely spent in idleness. The Richmond County Committee, which is doing so much intelligent and helpful work, sends the following report: "The Brabazon Work has been started and has given occupation and pleasure to several of the inmates; floor-cloths and mats have been made and sold, a small percentage on each article being paid to the inmate who worked it, and she gives it to the matron to spend for her. The rest goes toward a fund for buying material."

The *Record* then quotes the following paragraphs, from a recent article, which might find corroboration in the experience of hundreds of physicians: "The fact of doing work which has a value, however slight, is a fact full of high suggestion to our worker. To have learned to sew the plainest seam well, or to thread a needle; to have learned to drive a saw or swing an axe effectively and with economy of strength, or to pile a range of wood intelligently, is to many a cramped, debased life not less than is the acquisition of the technic of his profession to the sculptor or the musician.

"With the discipline of work rightly directed, comes 'feeling for good work,' the perception of order and form and beauty, the quickening of moral sense, the turning of desire toward that which is above. From the lowest detail of handwork an upward way opens and invites the soul to rise in it."

These results of work, well performed, are true to the point of being a truism—they may be the physiological effects of the tenth sense, "the sense for good work."

CHOLERA.

Since our last issue cholera has spread with even more than usual rapidity. In Europe it is no longer confined to the seaports of Havre, Hamburg and St. Petersburg, but is also in Berlin, Antwerp, Liverpool, London and at other points in England.

In Great Britain but little dependence seems to be placed in quarantine measures for the effectual stoppage of the introduction of the disease. The sanitary officials relying more upon a good sanitary condition of the cities and towns, hoping thereby, to ameliorate the force of the epidemic, which seemed certain to evade all quarantine barriers that might be erected against its invasion.

In our own country the National Government has established strict quarantine stations at all ports of entry, and has done everything possible in that way, except to suspend immigration. This has been urged by the Michigan State Board of Health, and although the measure is extreme, the existing conditions are such as to warrant its adoption. There is no doubt as to the supreme value of quarantine measures, but to be effectual against the introduction of so infectious a disease as cholera, these measures must approach conditions of complete isolation.

State, city and village health boards are all active in bringing about a most desirable condition of public cleanliness.

Native Americans are generally pretty well informed in regard to correct rules of diet and living, but we have an enormous population of recently arrived immigrants, many of whom are of the lowest grade of intelligence. All their lives accustomed to the most unsavory conditions, ignorant of the common laws of health and disease, they naturally congregate in the large cities, and crowd into the vilest of tenements, where they constitute ready receptacles for any infectious disease.

Our country can well afford to suspend immigration for several months. If a cholera epidemic will show to our National Congress that for altogether too

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long a period this country has been an indiscriminate and dangerous dumping ground for the slums of European and Asiatic countries, it will not be an unmixed evil.

There is a brotherhood of man which says we are our brother's keeper, at the same time in the brotherhood of Nations it may become our duty to instruct Kings, Emperors and Princes that it is their duty to provide for those of their own households and dominion, and to do it in their own country.

MEDICAL EDUCATIONAL REQUIREMENTS IN THE UNITED STATES.—Since the adoption, by a majority of the colleges in the United States, of a minimum standard of requirement embracing three courses of graded instruction, of not less than six months each, and a standard of preliminary educational training of all medical students, the question of recognition of graduates of those schools which do not observe this standard, has been practically settled by the American Medical Association. At Detroit, on Thursday morning, June 9, 1892, a preamble setting forth the requirements of the Association of American Medical Colleges, and a resolution demanding of all the colleges in the United States the adoption and observance of a standard which shall not fall below the minimum requirements of the College Association, were unanimously adopted, and the Secretary directed to forward a certified copy to the Faculties of all the colleges, and to each medical journal.

It is clearly apparent from this action, and from the recent action of many of the State Societies, that graduates after July 1, 1892, from colleges which disregard this mandatory action of the American Medical Association, cannot be recognized as regular physicians, inasmuch as they have not passed through the required course of educational training. Societies, therefore, otherwise entitled to representation in the American Medical Association cannot, if they admit such persons to membership, be longer entitled to send delegates to the National body. Colleges disobeying the resolutions of the American Medical Association clearly put themselves beyond recognition, and it is likely that the members of their Faculties will be refused the right to register in the National body, either as permanent members or delegates.

REVISION OF THE CODE OF ETHICS.—For sometime it has seemed desirable to reorganize the National Association on a plan similar to that of our general government, so that every State and County Society in the United States with their individual members would become component parts of the great central organization and brought into closer relations with and more earnest support of it than seems to be attained by the plan now in vogue.

If some feasible means be suggested whereby this will be accomplished, there can be but little doubt of the more rapid growth and greater strength of the Association. The suggestion which the Journal puts forth now is that the Association be so reorganized as to bear the same relation to the State Societies and their subordinate county or local Societies that the national government bears to the several States that compose the Union, with the proviso that each State shall be in its medical organization as it is politically, sovereign, and have the right to make its own laws and code of ethics to suit the varied conditions of the medical profession as they exist in each of the States.

In a country so vast and varied as ours, with its dissimilarity of medical population as much as in other respects, it may not be possible to promulgate a general code that shall be applicable in all the States.

The State of New York, with its cosmopolitan population from all the quarters of the globe, its immense hospitals, great schools, private sanitariums, dispensaries and clinics, with medical laws and medical men as varied, may not find it possible to conform to a law that is applicable in Arkansas, where there are no large cities, few specialists, one medical school, no private sanitariums, etc., etc.; without a State Board of Health and having one of the vilest medical laws that ever disgraced the statute book of a State.

Or, maybe, Alabama, with the whole medical act administered through the machinery of her State Society, cannot find it consistent to say that her *regular* physicians shall not consult with those who, though technically *irregular*, have nevertheless been by the agents of her State Society licensed to practice medicine. In Alabama it would be embarrassing to a member of a board of examiners to have to refuse to consult with one whose license bore his signature attesting the ability of its holder to practice medicine.

There are no two States in the Union having the same medical laws, and the same conditions of the medical profession do not exist in any two of them. Then why not let each State Medical Society adopt its own organic law and code of ethics, which shall be subject to the approval or rejection of the American Medical Association just as each State is admitted to the Union by an act of Congress enabling it to call a convention and adopt a Constitution which shall conform to the requirements of the Constitution of the United States.—*Jour. Ark. Med. Society.*

ASIATIC CHOLERA IN EUROPE AND AMERICA.

We are indebted to the Tennessee *State Board of Health Bulletin* for the following concise account of the various epidemics of Asiatic cholera and their course:

In view of the extensive and steady spread of cholera in the Russian Empire, and of the great uneasiness manifested both in Europe and America as to its becoming, as in former years, a pan-epidemic, we give in this *Bulletin* memoranda connected with its past history. All sections of Tennessee have been visited by this disease at different dates from 1833 to 1873, inclusive. By observation or by tradition all our people are more or less familiar with it. In a subsequent number we hope to give an outline of its history in Tennessee.

One broad fact appears in lucid brightness. The mystery that once enveloped the plague no longer exists. It need not get into the Union or into Tennessee. If from culpable oversight, carelessness or penuriousness it does get over the lines, it need not spread. Isolation, sanitation, disinfection, humane care are the safeguards. Money will secure all these. The public can well afford to furnish all that is wanted for this purpose, since the return is truly a hundred fold.

1629.—Bontius, a Dutch physician at Batavia, described the disease and first made it known to the medical profession in Europe.

1817.—It raged with great violence at Jessore, from whence it spread, not very swiftly, but with great certainty, in all directions.

1818.—By August it had reached Bombay. Thence it traveled through Arabia, Persia, Mesopotamia, Syria, etc., on its westward course, and, continuing to extend itself eastwardly from its place of origin, invaded the Burmese Empire, Siam, Java, China, and other populous countries of that portion of the earth.

1823.—It appeared at Orenburg and Astrachan, on the eastern frontier of Russia.

1828.—Remained here until this year, when it increased in violence, attacking a tenth of the inhabitants of the province of Orenburg, proving fatal to a fourth of those affected.

1830.—Reappeared at Astrachan. In less than a month 4,000 persons died of it in that city, and over 21,000 in the province.

1831, June 26.—Appeared at St. Petersburg, having ascended the Volga and destroyed thousands in Moscow. From Astrachan it also diverged along the northern coast of the Black Sea, and thence spread into Austria, Poland, Prussia and Northern Germany.

1831.—In August it was conveyed to Cairo by a caravan from Mecca. Over 15,000 died of it.

1831, October 26.—It appeared for the first time in England at Sunderland, from whence it spread slowly through the northern part of England and into Scotland.

1832, February 14.—It broke out in London.

1832, June 8.—The cholera broke out at Quebec, its first appearance in America. Two days afterward it was in Montreal.

1832, June 24.—New York was attacked. From thence it spread to Albany, Philadelphia, Cincinnati, New Orleans, etc. In New York it reached its height on the 21st of July.

1836.—It lingered in the United States for four years, and then entirely ceased. This first epidemic of cholera cost Great Britain and Ireland 40,000 lives out of 116,000 persons attacked. In the cities of Quebec, Montreal, New York and Philadelphia, embracing then about 450,000 inhabitants, there were over 18,000 cases and 8,000 deaths. In India it remained endemic. Other Asiatic countries also suffered severely.

1846.—It appeared at Kurrachee early this year, near the mouth of the Indus, with terrific violence. Thence to Teheran, capital of Persia. Here its severity was such that 300 perished daily for several weeks in a population of not more than 60,000.

1847 and 1848.—Cholera ravaged parts of Russia and Turkey, having entered Eurrpe by almost the identical route as before. It traveled, however, with much greater rapidity.

1848.—In the autumn it appeared in France and Great Britain, revisiting during the next eight months with almost unerring certainty every place in which it had appeared in 1832–33, and seeking out the same filthy lanes and undrained sections of the cities where it had then committed its greatest ravages. It was even more malignant than in its previous visit. In England and Wales it carried off 53,293 persons.

1848, December 4.—The ship New York, from Havre, arrived at Staten Island with cholera among her passengers.

1849.—It occurred in New York. The whole number of cases reported outside the hospitals in fifty-two days were 2,681, of which 915 died. Also in New Orleans, and spread over the greater part of the Eastern and Western States.

1850.—In New Orleans deaths from cholera May to December, inclusive, 824. Cases occurred as late as February 15, 1851.

1850.—At Cincinnati, from June 1 to August 15, 1,400 deaths from cholera. At Columbus, Ohio, from the 24th of July to August 25, 195 deaths from cholera—a great mortality for the population.

1851.—A second visitation at Cincinnati. Some 200 deaths, mainly in July.

1851.—From April to August, inclusive, 766 deaths from cholera in St. Louis. Total for the year, 847.

1852, May, June and July.—Numerous cases in Cincinnati.

1852.—Total deaths in St. Louis for the year 789, of which 508 in June and July.

1854.—Cholera as virulent in St. Louis as it was in 1849. Total deaths 1,534, mainly in May, June, July and August.

1855.—Disappeared from the United States.

1853, 1854.—Prevailed in Great Britain.

1855, 1856.—The allied armies in the Crimea suffered intensely.

1865–1874.—Cholera persisted in Europe about ten years.

1865.—In the beginning of May it broke out with terrible fury among the pilgrims at Mecca. On the 10th or 11th of May the first death occurred at Alexandria. In June it had reached Cairo. On the 3d of July at Constantinople, where it produced a terrible panic. From Alexandria a steamer conveyed it to Marseilles. From thence travelers carried it to Paris.

1865, September.–Several cases at Southampton, England. Did not spread.

1865, November 3.—Steamship Atalanta came into the lower bay of New York with 400 German immigrants, and cholera. Precautions taken; no spread.

1866, July 7.—At Ancona in Italy, from Alexandria.

1865.—Great epidemic at Valencia, in Spain. Thirty-one out of forty-nine provinces in Spain were ravaged from July till the close of the year. It extended also into Portugal.

1866.—Cholera was early reproduced in almost all the localities it had visited in 1865. It extended northward as far as St. Petersburgh. It appeared in several localities in Bavaria, Saxony and Prussia, also in Belgium and Holland. It still existed in Paris and extended to the northwest of France.

1866.—An epidemic in Liverpool from July 22, to the end of November carried off 1 792 victims. In London for the four weeks ending August the 4th, the deaths were 63,481, 1,097, 1,178. More or less diffused over England during the summer.

1866.—It broke out in New York about the beginning of May, and gradually spread over the country, following the lines of travel. Prevailed extensively in the United States army, causing over 1,200 deaths among officers and men. During summer and fall prevailed extensively at New Orleans. Prevailed at St. Louis also.

1867.—A general abatement in Europe. Prevalent in South America. Buenos Ayres suffered greatly.

1867.—At New Orleans, reappeared in June; 571 deaths the following six months. Again at St. Louis during summer and fall.

1868.—Completely died out in Europe.

1869.—By its old route it reached Nijni Novgorod, and broke out in September.

1870.—A vast outburst of cholera. In Russia, 9,386 deaths.

1871.—In Russia, 124,834 deaths.

1872.—In Russia, 113,196 deaths.

1873.—In Russia, 4,395 deaths.

1872.—Very widely diffused over Europe. Imported into England on several occasions. Its spread stopped by the local sanitary authorities.

1873.—Began to subside in Europe.

1872, December, and 1873, January.—There arrived at New Orleans a total of nearly two thousand immigrants from cholera infected districts of Europe.

1873, February 9.—First death at New Orleans. Two hundred and fifty-nine fatal cases occurred during the epidemic.

1873, April 8.—First case, fatal, at Vicksburg.

1873, June 30.—First case, fatal, at Little Rock. Four importations; no spread owing to the energy and efficiency of the medical men in whose care the initial cases occurred.

1873, April 15.—First case, fatal, at Memphis.

1873, May 24.—First case, fatal, at Chicago. Total number of deaths from cholera and cholera morbus, May and September, one hundred and sixteen. Many towns and villages suffered greatly.

1873.—First case at St. Louis, died 11th of May. A mild epidemic followed. Other localities visited.

1873.—First case at Paducah, died May 21. Very widely diffused throughout Kentucky.

1863, June 15.—First death reported at Cincinnati. Two hundred and seven deaths during the summer. Other cities and towns in Ohio visited.

1873.—June 6.—First death at Evansville. Other localities in Indiana visited.

1873.—During June and July sixty-two deaths at Huntsville, Ala., Birmingham, with about three thousand inhabitants, was terribly scourged during June and July.

1873, June 15.—First case, fatal, at Wheeling.

1873.—But two authenticated cases of cholera occurred in the State of Georgia. Both were residents of and refugees from Chattanooga. One died at Atlanta, population 22,000, on July 2. The other, at Dalton, population, 5,000, on July 3. Both instances terminated fatally in communities in which the auxiliaries to the rapid development of a cholera epidemic were present, the specific causes once having been imported; yet in both instances, by the prompt and energetic action of the medical men having the case in charge, the power of the disease was confined to the infected individual, and the health of the residents of the respective houses and of each community were efficiently guarded.

1873.—During this year some two hundred cities and towns in the Mississippi valley were more or less afflicted. See *Public Health*, Vol. I, pp. 224–252.

1882.—Made its appearance in Egypt, where in three or four months it occasioned a mortality of 30,000 to 50,000 of the inhabitants.

1884.—On June 13 or 14, it invaded the French military post, Toulon. Then the cities of Toulon and Marseilles, and spread through the south and southeast of France, and partly in central and western France.

1885.—At Marseilles and in Bretagne.

1884.—About August, in Spain.

1885.—Invaded almost the whole of Spain.

1884.—Brought into Italy.

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1885.—Great ravages at Palermo, Sicily.

1885-6.—At Venice.

1886.—From April during the rest of the year it ravaged the peninsula of Italy.

1886.—At Trieste, and also the Austro-Hungarian shores of the Adriatic.

1887.—Again in Sicily and in Italy.

1884-1887.—The epidemic of cholera in Europe cost France 15,000 inhabitants in 1884, 1885 and 1886; Spain, 180,000 inhabitants in 1884 and 1885; Austro-Hungary, 4,000 inhabitants in 1886; Italy, about 50,000 inhabitants in 1884, 1885, 1886 and 1887; Malta, 500 inhabitants in 1887; a sum approximately of 250,000 inhabitants of Europe. In other words, the epidemic has removed from France about one inhabitant for every 3,000, from Italy one inhabitant for 550 or 600, from Spain one inhabitant for every 100, from Austro-Hungary one inhabitant for every 9,000. An approximate calculation of these losses, estimated from the purely material point of view, shows a sum total of about $80,000,000 of value destroyed. A still greater loss resulting from the damages caused by the disease through idleness, interference with commerce and navigation, interruption of business, etc., would increase the sum total of the losses occasioned by the cholera to about $200,000,000 in three or four years. See report of E. O. Shakespeare, M.D., U. S. Commissioner.

1886.—Cholera introduced into Buenos Ayres, Argentine Republic, in November, by the ship Perseo, plying between that city and Genoa. A conspicuous instance of official pride and stupidity. An extensive epidemic developed, and the disease spread through the inland provinces. The city was cut out entirely from the commercial world; Uruguay, Brazil, Paraguay, and most of the European ports quarantined against it.

1887, January 19.—Cholera officially declared at Montevideo, Argentine Republic, after many denials of its existence.

1887, January 2.—Cholera at San Felipe, a town situated near the base of the Andes, 40 miles north of Santiago. The latter city severely scourged. Commerce of Chili interrupted, with heavy losses.

1887, September 23.—The steamship Alesia arrived at New York from Marseilles with cholera on board. At Naples some 600 immigrants, from the cholera districts of Italy and Sicily were taken aboard. Proper precautions used by the quarantine officials and the disease not allowed to spread. Much credit claimed, and justly, considering their limited means.

However, the case of the Italian steamer Independente, which arrived in New York in October with a large number of immigrants, and not showing cholera on board, was allowed to discharge her passengers, after a few hours of detention, necessary for a thorough inspection, shows the insufficiency of this New York safeguard. The next day numerous squads of these immigrants, with their baggage, departed for at least twelve great cities, in widely distant parts of the country.

CHOLERA IN EUROPE 1892.

1892, June 27.—At Baku, the Russian port on the Caspian, 48 new cases and 38 deaths. The town in a deplorably filthy condition, and without the least pretense of sanitary arrangement.

June 30.—Rome—Five cases have occurred in Italy.

July 1.—The administration of the towns in the Asiatic provinces of Russia taking energetic measures to prevent its spread.

July 1.—Many cases reported in the outskirts of Paris.

July 6.—Saratoff on the Volga scourged.

July 8.—Panic in Astrakhan.

July 11.—In Paris 14 deaths.

July 14.—Terrible in Astrakhan.

July 17-21.—Russian official returns announce 4,839 cases and 2,590 deaths for this period.

July 23.—Advance toward the Russian frontier. Absorbs public attention in Berlin.

July 23.—At Nijni Novgorod and Moscow. Expected at St. Petersburg.

August 5, 6.—Cholera returns for all Russia these two days show a total of 6,741 new cases and 3,496 deaths. Prior to August 1, total deaths, official, 23,919.

August 1-12.—In St. Petersburg 154 cases and 31 deaths between these dates officially admitted.

August 11.—In Northern and Central Russia increasing. In Moscow many factories closed.

August 13.—Returns for Russia this day show a large increase in new cases and mortality.

August 15.—Total number of new cases reported in Russia, 7,600; total deaths, 3,900. Two-thirds of the towns attacked can make no reports for lack of telegraphic connections.

BOOK REVIEWS.

TREATISE ON THE DISEASES OF WOMEN. FOR THE USE OF STUDENTS AND PRACTITIONERS, by ALEXANDER J. C. SKENE, M. D. Second edition, revised, enlarged and finely illustrated. New York: D. Appleton & Co., 1892.

The first edition of this valuable work at once received from all students of gynecology the stamp of commendation, as it was a most excellent exponent of the most advanced professional knowledge of diseases of women. Its immediate adoption as a standard text book in the colleges, indicates its appreciation by both teachers and students.

That the work may be continued in this high position, its author has thoroughly revised the book and added new chapters on ectopic gestation, diseases and injuries of the ureter, vesical hernia and its surgical treatment. While his latest views, particularly find expression in the chapters on laparotomy, ovaritis and injuries of the cervix uteri and pelvic floor. Typographically, the book is a work of art.

HUMAN MONSTROSITIES, by PROF. BARTON COOKE HIRST, M.D., and PROF. GEORGE A. PIERSAL. Part iii, with nine photographic reproductions and thirty-four wood cuts. Philadelphia: Lea Brothers & Co.

This, the third volume of this highly artistic and scientific work, has many features of attractiveness. The plates comprise beautiful illustrations, from photographs, of typical specimens of rhinocephalus, cyclocephalus, acephalus and diprosopus. The plates represent the various monstrosities in several positions, thus giving a most accurate demonstration of the peculiarities of each, and enabling the seeker after information, to classify any particular specimen quite readily.

SEVENTH ANNUAL REPORT OF THE STATE BOARD OF HEALTH OF THE STATE OF KANSAS. For the year 1891. E. H Snow, State Printer, Topeka. 1892.

This is the first report issued under the direction of the new secretary, Dr. M. O'Brien, of Topeka. We seem to miss the practiced hand of Dr. J. W. Redden, whose reputation as a sanitarian is as wide as the country. His resignation took effect in July, 1891, and it can hardly be expected that we will see his signature again in an official capacity. We trust that the Commonwealth he well served has not been ungrateful towards him.

This volume presents more popular reading than is commonly found, and we judge that its contents are aimed to do missionary labor in political fields that are disinclined to perform their full sanitary duty. The following epistle appears in the Report to show the opposition met by the State Board in their efforts to establish local boards of health.

"*two the board of helth offiscer of the Stait of Kan.*

"threw request of docter ——— of ———, I wish to write and Stait that the board of county cometioners have concluded mot to hier a county helth oficer as it Seems to bee the publick centiment of the peopel of this county that it is a waist of public funds to pay a pyhfesetion to look of the helth of this county and it seems to bee an imposibilety to get the docters of this county to make a report of the berth and dethe of the county and aS an impartiel report is aquivelent to now report a tall the county cometioners have decided to retain the services of docter ——— as a Kind of a figuer head in case of an epodemic to act as help oficer and mke Such reports as seems best and the board a Grees to pay him according to his work.

respectively yours

———, *Chairman of the board of County cometioners.*"

The writer of the report adds:

"This communication is not introduced to illustate the

humor of the situation, although the situation does, at long intervals, take on a humorous aspect; nor is it introduced primarily to disclose the insufficiencies of the "Chairman of the board of County cometioners." To write and read come by nature, and have been called a vanity. We desire only to call attention to the degree of obliquity against which Health Boards must make head, even in enlightened Kansas."

But the County Commissioners are not the only dealers in phonetic discourse. In another part of the report is printed the letter of a practitioner of Greencastle, Missouri, who, being "too grossly ignorant and illiterate to be permitted to engage in practice elsewhere, find ready asylum here,"—in Kansas, sent an inquiry to the Board. It is with reluctance that the Secretary confesses that the writer of the following could settle in Kansas any day or hour he may elect:

"Dear Sir i Would like to know What the laws is in regarde to the practice of medicin in the state of Kansas is a man aloud to practice their With out a certificat from a medical School i have ben tolde that the board of health gave permishon in that State if so when does board meet and if i can get the endorsement of three practicing physicians Would that do or Would i half to come before the board."

The old plea of "fair play" is worn threadbare in the cases of such pretenders as these, and yet this plea speciously and persistently presented has thus far defeated every effort toward the passage of proper restrictive legislation. On pages 70, 104 and 224 are given some very sharp home-thrusts against the different charlatans who thrive on the sufferings of Kansas citizens. The long-haired itinerant with his band-wagon and female accompaniments, whose pranks and antics serve to beguile a tedious day appears as an especial pest. Having quoted so much from this Report we purpose to take one more selection, giving a sweeter, nobler picture —and one which we are thankful to say finds frequent mention in the literature of the present time—an able man's reminiscences of his family doctor. The writer of the following sketch from life is Chief Justice Horton of the Supreme Court of Kansas.

"I recall with affectionate remembrance our family physician, upon whom from my earliest childhood I looked with youthful reverence and unquestioning faith. Before me, today, I see his kindly face and listen to his pleasant voice. He was a very hero, in my eyes; of commanding figure and magnificent physique. There could be no finer, braver, better man. He was the wise counselor, the skilled restorer, the sympathetic friend. The silver had crept into his hair, and careful thought and much exposure had lined his brow, but there was ever about him a brightness and cheeriness which seemed a part of his presence, only that it lingered after he had gone. I recollect that one of our neighbors went raving crazy, and with a gleaming razor menaced a crowd which gathered around him. But the doctor, alone, rushed dauntlessly forward, overpowered and unhanded him, exhibiting a physical courage and prowess sufficient to win the heart of any boy. Yet it was not this instance of fearlessness in time of danger which in my maturer judgment went furthest to prove his resolution and heroism. It was the tried and constant disregard of self, through the long years of a varied practice. No call was disregarded; no contagion appalled, no storm or tempest ever dismayed him. The humble and poor received his attentions in equal measure with the wealthy and influential. All of his life he went about doing good, ministering to the afflicted. His heart was in his work. His zeal, energy, patience, skill and industry combined in modeling the man fit for the highest ideal of life.

> 'A combination and a form indeed,
> Where every god did seem to set his seal
> To give the world assurance of a man.'"

Judge Horton's entire address is an argument to show why legislation is proper that will make men like the foregoing a staple product of the State, and make the long-haired ignoramus a contraband and fugitive. Judge Horton would seem to be a "tower of strength" to legitimate medicine in his State.

MISCELLANY.

UNFIT FOR COLONIZATION.—An agent of Baron Hirsch reported that the Jewish peasants in the Odessa district are so degraded that the Argentine Republic would not allow them to be sent to the Jewish colony there, and that it is therefore expected that they will be sent to the United States.

THE death of Dr. Thos. F. Wood, the well-known editor of the *North Carolina Medical Journal*, is briefly announced in that publication.

OFFICIAL LIST OF CHANGES in the Medical Corps of the U. S. Navy, for the Week Ending August 27, 1892.

P. A. Surgeon C. W. Rush, from special duty in connection with the International Railway Commission, and to the Navy Yard, New York.

OFFICIAL LIST OF CHANGES of Stations and Duties of Medical Officers of the U. S. Marine-Hospital Service, for the Three Months Ending August 20, 1892.

Surgeon P. H. Bailhache, granted leave of absence for fourteen days. May 25, 1992.

Surgeon George Purviance, granted leave of absence for seven days. August 9, 1892.

Surgeon John Vansant, granted leave of absence for thirty days. August 13, 1892.

Surgeon H. W. Austin, granted leave of absence for thirty days. June 21, 1892.

Surgeon G. W. Stoner, to proceed to Port Huron, Sault. Ste. Marie, Saginaw, Marquette, Mich., Duluth, Minn., and Superior, Wis., as inspector. July 11, 1892.

Surgeon F. W. Mead, granted leave of absence for thirty days. August 3, 1892.

Surgeon H. R. Carter, to proceed to Chicago, Ill., as inspector of unserviceable property. August 16, 1892.

P. A. Surgeon Eugene Wasdin, granted leave of absence for twenty-eight days. July 21, 1892.

P. A. Surgeon J. H. White, granted leave of absence for thirty days. August 13, 1892.

P. A. Surgeon P. M. Carrington, granted leave of absence for twenty-seven days. August 13, 1892.

P. A. Surgeon W. B. McIntosh, granted leave of absence for thirty days. July 8, 1892.

P. A. Surgeon G. M. Magruder, granted leave of absence for seven days. August 18, 1892.

P. A. Surgeon R. M. Woodward, granted leave of absence for twenty-five days. August 1, 1892.

P. A. Surgeon J. B. Stoner, granted leave of absence for twenty-six days. August 13, 1892.

Asst. Surgeon A. W. Condict, granted leave of absence for twenty-six days. July 21, 1892.

Asst. Surgeon S. H. Hussey, to proceed to Galveston, Texas, for temporary duty. August 11, 1892.

Asst. Surgeon C. P. Wertenbaker, to proceed to Pittsburgh, Pa., for temporary duty. August 9, 1892.

Asst. Surgeon J. C. Perry, to proceed to Charleston, S. C., for temporary duty. July 19, 1892.

Asst. Surgeon A. C. Smith, granted leave of absence for twenty-eight days. August 13, 1892.

Asst. Surgeon M. J. Rosenau, to proceed to Cairo, Ill., for temporary duty. July 27, 1892.

Asst. Surgeon L. E. Cofer, to proceed to Norfolk, Va., for temporary duty. June 10, 1892. Granted leave of absence for twenty-three days. August 6, 1892.

Asst. Surgeon J. M. Eager, to proceed to Evansville, Ind., for temporary duty. August 11, 1892.

Asst. Surgeon J. A. Nydegger, assigned to temporary duty at Baltimore, Md. July 6, 1892.

Asst. Surgeon W. J. S. Stewart, to proceed to New York, N. Y., for temporary duty. July 6, 1892. To proceed to Wilmington, N. C., for temporary duty. July 19, 1892. To proceed to Savannah, Ga., for temporary duty. August 9, 1892.

PROMOTIONS.

Stoner, J. B., commissioned as P. A. Surgeon. June 30, 1892.

Guiteras, G. M., commissioned as P. A. Surgeon. July 27, 1892.

APPOINTMENTS.

Nydegger, James A., M.D., of Maryland, commissioned as Asst. Surgeon. July 1, 1892.

Stewart, William J. S., M.D., of Pennsylvania, commissioned as Asst. Surgeon. June 30, 1892.